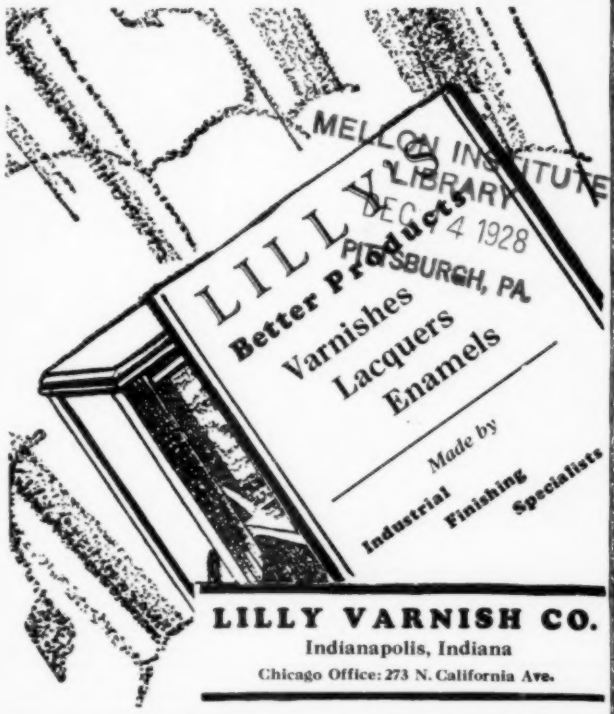
NOVEMBER, 1928
Indianapolis, Indiana

Industrial Finishing
MAGAZINE



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THE FINISH OF FINE WRINKLES

With Damaskene, the original wrinkle finish, you can produce a pine tree effect that for richness and sheen cannot be duplicated. Damaskene Jr. is a finish of fine wrinkles that is also both beautiful and practical. May we send you complete details together with our interesting booklet, "The Story of Damaskene"?

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Varnishes Enamels and Lacquers
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Lacquer-Clear, All Colors, White & Black
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Industrial Finishing

Reg. U. S. Pat. Off.

An Independent Publication Devoted To The Finishing of Industrial Products

Vol. V, No. 1 NOVEMBER, 1928 $1.00 a Year

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With the Editor

EVIDENCE of continual change is always with us, but this month it is perhaps a little more forcible and emphatic. The U. S. A. presidential election is over, Thanksgiving is at hand, Christmas will soon be here and another year of progress and prosperity will be ended.

Much that is new in style and performance has been developed and adopted during 1928. Sensing these changes and being alert to modern trends, INDUSTRIAL FINISHING steps forth this month in new front cover design and new headline type. November marks the beginning of INDUSTRIAL FINISHING's fifth year, and in the spirit of Thanksgiving we take this occasion to express our sincere appreciation for the valued interest and co-operation of all firms and individuals in the industry. To us, the future looks unusually promising, and INDUSTRIAL FINISHING welcomes the opportunities at hand to perform a still greater service for an increasing number of firms and individuals.

How to make use of all known cleaning, finishing, decorating and polishing materials or equipment employed in industry, discussions of the various ideas, suggestions and recommendations offered by practical and technical men's articles, news of what is new, answers to specific questions—these features, clearly presented in the editorial pages, have proved to be of extraordinary value to men who have anything to do with formulating, selling, servicing, purchasing or using materials or equipment employed in any phase of industrial finishing.

INDUSTRIAL FINISHING strives to present variety and it obtains variety from an ever increasing number of men who write—men employed in various capacities in industry and located in all parts of the country. This variety, we believe, produces the greatest service for the greatest number.

O. W. Rohr

Managing Editor

Director of Sales in the industrial field lists the characteristics essential in a finish for machinery. Resistance to oils and other disintegrating substances are important. Color, ease of cleaning, appearance in general must also be considered.

Building a Machinery Finish

Director of Industrial Sales of E. I. du Pont de Nemours & Co., Inc., discusses problems of a special phase of the finishing field

By L. P. Nemzek

BY its very function, a finish for machinery should be resistant to oils, greases, gasoline and alkaline substances, and to abrasion. It should be easy to clean. It should have lasting attractiveness.

All heavy machinery is subjected to the action of oils and greases, as lubricants are necessary for maintenance. Lathes, drill presses, stamping machines, and nearly all machines employed in machine shops, come also in contact with various cutting liquids. Many of these contain soap and alkali, as well as oily products. Finishes not resistant to the action of all of these substances soften, disintegrate and become unsightly.

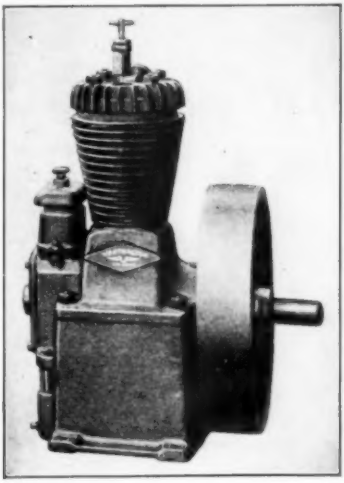
The hard usage to which machinery, especially that in machine shops, is subjected, requires that the finish also be hard and resistant to abrasion.

No manufacturer today denies the importance of the psychological effect of a handsome finish upon operators of machines. And when finishes are selected which have good light reflecting qualities there are fewer accidents and the quality of the work is improved.

Especially when light colors are used, it is essential that any dirt, grease or oil can be readily cleaned off without injury to the finish. As the easiest way to accomplish this is by wiping with a rag wet with gasoline, gasoline resistance is an important property of machinery finishes.

Light colors also make dirt, oil and grease readily visible. With them spoilage of manufactured articles is reduced. In the printing industry, for example, they make it easier to avoid ink smudges, and in textile mills, the soiling of yarn and fabrics.

The excellent alkali, oil, grease, gasoline and abrasion resistance of Duco makes it an ideal finish for machinery. The ease of cleaning and broad range of color selection make possible light, attractive colors which promote cleanliness, accuracy, safety and, in general, better working conditions.—*Advertisement.*



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and satisfactory service

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Compressor cooling system is amply proportioned and compressors are furnished in either air-cooled or water-cooled types.

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The shaft, crank, pin and counterweight are all a one-piece drop forging, while the frame is of sturdy, simple and accessible design.

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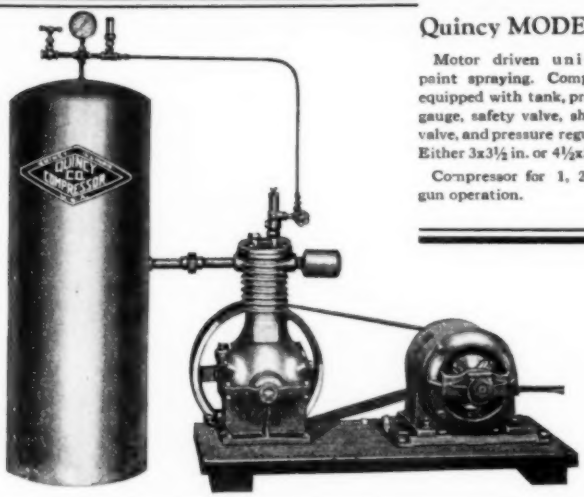

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shortest methods to produce a
finished result that will add
sales value to
your line.

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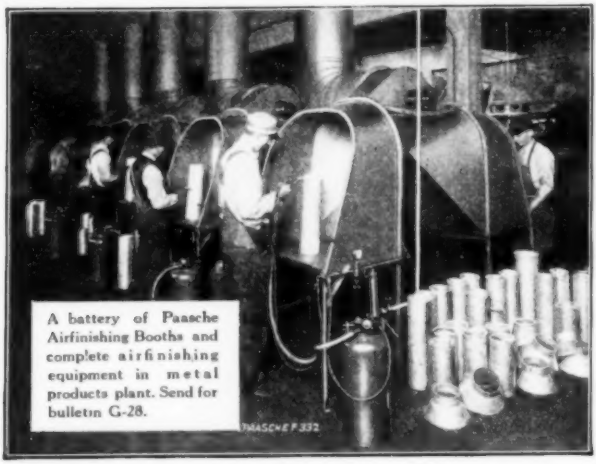

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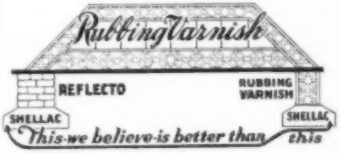

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"They All Say So"

Yes, we know that they all claim to give a finish requiring no rubbing, and that their gun is non-clogging, prevents orange peel, waves, streaks, etc. down the whole alphabet.

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in either fine wrinkle, or large pine tree effect!

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can be depended upon to produce the same desired effect ***each and every time.***

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NEW WRINKLE FINISHES

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Since 1876

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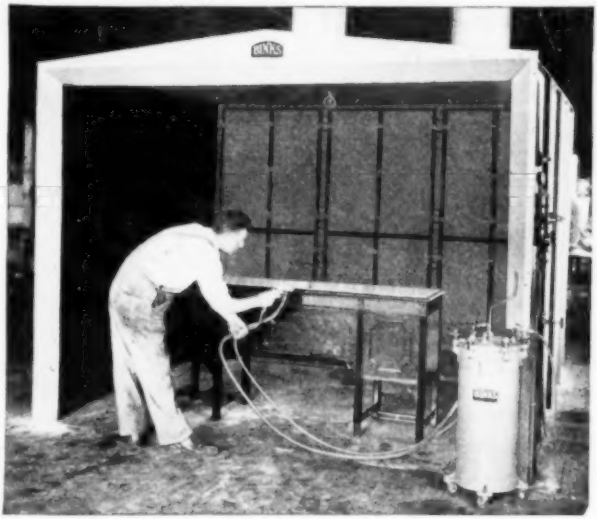

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Write for Spray Booth Bulletin

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W-Surfacer . . .

It fills in one coat--works rapidly and sands easily. For use under lacquer enamel finish on wood or composition. Lacquer enamels, brushed or sprayed over one sanded coat of W-Surfacer, give a smooth and presentable job. Try it — you'll find that it fills the need. Should be reduced with equal part of thinner for spraying.

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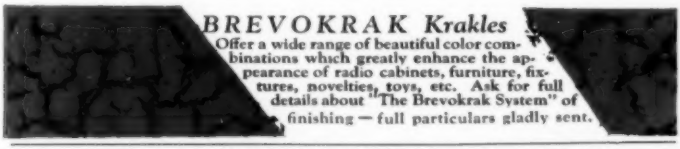
"Values that Endure"

COMPANY

BREVOLITE Lacquers and Lacquer Enamels

Waukegan Illinois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The foundation finish for lacquer and other finishes

Dries in thirty minutes

DO NOT BREAK THE SEAL

By Sanding

QUICK-SEAL.

Does not require sanding

Manufactured by

Advance Paint Co.

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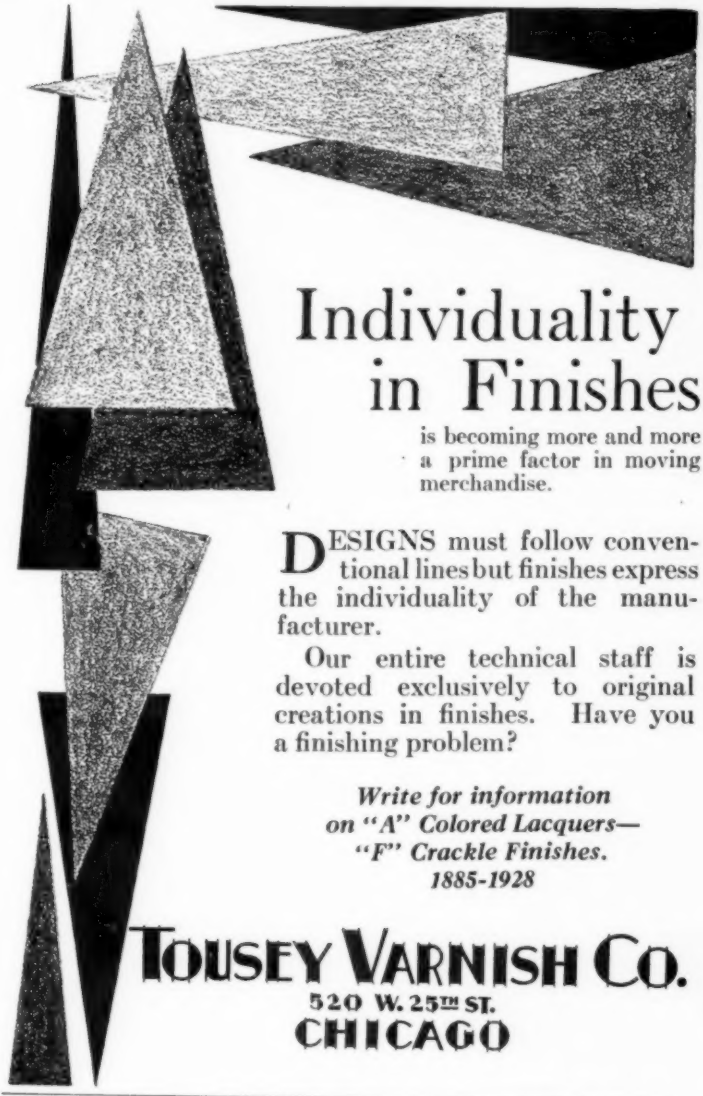

Individuality in Finishes

is becoming more and more a prime factor in moving merchandise.

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Our entire technical staff is devoted exclusively to original creations in finishes. Have you a finishing problem?

Write for information on "A" Colored Lacquers— "F" Crackle Finishes.
1885-1928

TOUSEY VARNISH CO.
520 W. 25TH ST.
CHICAGO

Stains for Lacquer Finishes

Ulmic stain materials, and their advantages over other types used in the wood finishing industry

OF THE water borne dyes used in wood staining there is one group which, because of its chemical nature, raises the grain of wood less than any other type. We refer to the colloid materials, the organic minerals which are grouped as Ulmins.

Other water stain types, as the acid stains and the water soluble anilines are chemicals ionized in an aqueous vehicle. They penetrate rapidly, and it is this rate of penetration which is largely responsible for the raised wood fibers. But the Ulmins are colloids and behave as such. Their rate of penetration, while rapid enough for all dipping and spraying operations, is somewhat slower than that of the above types, and consequently the raising of the grain is less.

Sanding is Less With Colloid Stains

But as a reward for sanding down some fuzz, the finisher using this colloidal stain material is assured of one hundred percent satisfaction in all other phases of his staining problems. To enumerate a few of these:

(1) The color is fast to light.
(2) The color "stays put," that is, it cannot creep into any subsequent finishing coats. Even lacquer, with its powerful solvents, does not effect this stain in any way.
(3) The cost per gallon is less than for any other type of stain.
(4) The stain is easy to apply; easy to modify; and easy to clean from containers, clothing, and person.

These first two considerations weigh heavily with those wood finishers who are concerned with their reputation. There is no danger of the finish going wrong through a fault of the stain at any time after it has left the factory. It is irrational to endanger a large investment in material and workmanship with a non-permanent, trouble making stain.

The latter two considerations weigh heavily with any wood finisher. The ease with which this colloidal stain may be modified manifests itself in two different ways. FIRST: It is entirely compatible with water soluble anilines and with other stain materials such as potassium dichromate. To these it lends its slower penetration rate, and in return borrows new color possibilities. SECOND: When applied to the wood, modification is easy, either by wiping with a damp cloth or by sanding. High lighted areas are thus obtained by either or both of these methods (as well as by spray gun shading), and results are positive, for correction is easy.

Live and Learn

A greatly improved and refined Ulmic colloid is now being produced by the Dakalite Products Co. of 13000 Athens Ave., Cleveland, O. Your tests will prove that mud and other insolubles are absent, the moisture content is cut down to a minimum, and a beautiful sun-fast shade of rich brown realized. Get a sample now and see for yourself what a vast improvement this new material is, over similar substances heretofore available. (Advertisement)

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Sun Flat Lacquer

We will display our goods at our expense, and give you practical advice. How best to use.

White No. 1 Lacquer

COLORLESS

Clear and transparent, looks like a coat of celluloid on work. Can be polished.

FINISHING ROOM FAVORITES

No. 115 Pale Rubbing

The reliable quality varnish that held its own so many years in the face of keen competition.

SUN VARNISH CO.

Louisville, Ky.

The

new studio service we offer our customers and friends is an extremely important one. Our art studio, completely equipped to work out finishing problems under the direction of one of the finest artists in decorative furniture designing in the country, is always at your service. Send in any piece or suite. We will finish it according to your instructions, or we will work out a suitable design and finish. When the piece is returned, we furnish your finishers with complete working instructions. This service is entirely free. Many of the most striking finishes at the current market were originally executed in our studio.

Write for details today.

USE OUR FREE STUDIO SERVICE

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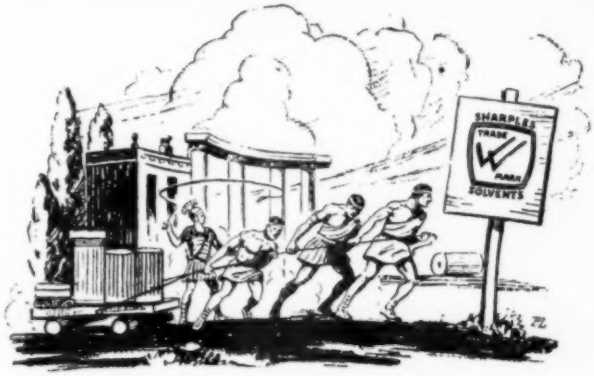
ROCKFORD, ILL.

"No Tampering With Quality"



BUILDING ROME IN A DAY

THE old adage, "Rome was never built in a day" certainly does not apply to Sharples.

In the brief space of eighteen months, PENTASOL and PENT-ACETATE have accomplished the seemingly impossible. They have become accepted solvent standards —and are being used in rapidly increasing quantities by America's leading lacquer manufacturers.

Such widespread and prompt acceptance by an industry that wisely shows caution in changing old formulae for new is both unusual and significant.

There is no better way to insure safe, positive lacquer formulation — and lacquers whose quality is uniformly high and unvarying—than by the proper use of PENTASOL and PENT-ACETATE.

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The individual painting or finishing problems of each class of users are specifically studied and served by specialized DeVilbiss installations, methods and devices. The best practice known today in the field in which *you* operate, and the most efficient and modern equipment for *your* particular use, are DeVilbiss methods and equipment. This experience and knowledge will save you money and time, and earn the good-will of your customer. Use it freely. We will esteem it a privilege to put it at your disposal.

THE DEVILBISS COMPANY

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Spray-PAINTING FINISHING System

DOES THE WORK OF FIVE MEN

FINISHING EXCLUSIVE FURNITURE

Revealing some of the finishing methods employed in a New York factory that specializes in exclusive designs and reproductions of fine classical furniture

By Donald A. Hampson

PART OF THE mechanical finishing department of the Orsenigo Co's. plant in Long Island City, N. Y. is shown in the accompanying cut. The product consists of furniture and interior decorations, all of exclusive design. The work is all patterned after early English and French masterpieces and often includes exact reproductions of rare old pieces which have been loaned for the purpose—some of them from treasured collections on the other side of the Atlantic.

Carvings enter largely into work of this class—some of them being machine cut and others hand tooled. Finishing also includes machine and hand work—with more of the former than one would suspect in work of such an exclusive nature. Into the spray booths shown in the picture goes the work of over 100 men in the various preceding branches of woodworking.

An immense variety of pieces are handled. In size, they range from small stands to massive old fashioned sideboards. Sometimes, a piece is too large to enter a booth, in which event it is usually placed as close as possible to the mouth of the booth, and sprayed.

Practically all woodwork is given an undercoat of stain. This is followed usually by two coats of lacquer. The prevailing preference is for a dull finish, this trend being evident even in reproductions. Thus the two coats may be of dull lacquer.

Two-tone effects are secured

more through the lights and shadows of carvings, or through a skillful blending of wood, than through finishing methods. Other means provide such contrasts as are needed. Before the final spraying, the pieces are allowed to stand in storage for a time to take on a slightly aged appearance. Glazing with pumice applied by means of a fine brush, or rubbed on, is also common practice; a mystic appearance is imparted by skillful use of this method.

Hand decorations form a large part of the finishing work. A daylight section of approximately 1000-sq. ft. is available for this department and here, six or more artists are continually employed. To meet the demand for a genuine Oriental touch to certain products a Japanese decorator is employed.

In Spanish and Italian motifs, gold plays a prominent part. All of this work is finished by laying on gold leaf. It is a slow and expensive process but one that is absolutely essential to produce the class of work being featured. No decalcomania or gilt imitations are permitted.

Similar processes go into products other than furniture. For example, the firm builds interior decorations for steamships, banks, and luxurious apartments. Through a careful system, the buyer is assured exclusive designs bearing a finish that is in keeping with them.

Fire means loss of customers, scattering of a skilled working force, vanished profit on unfinished work and a setback that may take years to make up.

Every far-sighted factory executive gives fire protection a definite place in his safety program.

Colored Lacquers and Colored Enamels

I have been asked so often, "How do colored lacquers differ from colored enamels? They are all lacquers, aren't they?"

They are all lacquers, that is true, but one is a clear solution, either transparent or translucent, while the other is a solution containing pigment, which is opaque.

A clear, colored lacquer for either dip, brush or spray work, is colored by means of adding aniline colors—either in solution form or dry—to a clear, transparent lacquer, to any desired intensity; by adding more or less, any desired shade is obtained. Applying this by one of the above mentioned methods and allowing it to dry, the article which has been lacquered is still visible through the lacquer film.

Colored enamels, on the other hand, are clear lacquers to which enough pigment has been added to give the desired strength and color. In contrast to the colored lacquers, colored enamels are entirely opaque, meaning that the surface of the article on which they have been applied is completely hidden. The colored lacquer is transparent while an enamel is opaque.

In addition, there are translucent lacquers which are transparent and which contain only a small amount of pigment to give a certain desired effect, and through which the article finished can be only slightly discerned.—G. O. Zeller.

Red, psychologists say, is the most powerful color known, because it stimulates the digestive system, the circulation of the blood, and arouses the forces of self-preservation in us.

Fact Finding Finishers Cannily Calculate . . . *Clip!*

Progressives Oust Obsolete Materials and Clip Costs by Using Zapon Sanding Sealer No. 1038 as Prime Coat Under Lacquer or Varnish

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Progressive finishers win great praise by reducing finishing costs thus permitting manufacturers to get more business with extra margin to play with in keenly competitive deals. Zapon Sanding Sealer No. 1038 clips big pieces off finishing costs. Costs less than good shellac; cuts sanding costs in half; dries in one third the time that shellac takes. And it does a better job.

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2. Cuts sanding costs in half.
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6. Will not bleach fillers.
7. Absolutely free from grayish cast.
8. Easier to spray than shellac.
9. The best base for lacquer.
10. The best base for varnish.
11. Waterproof.
12. No Benzol—or Wood Alcohol.

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Cost clippers cast aside the gloomy cloak of cohibiting custom and learn this easier and more profitable way to efficient production! We mean just that! We have the means and the desire to help you. Will you let us? We publish this advertisement to urge you to clip the coupon and send it to us. Why?

Because this product is good. It's a sample of our line of finishing materials. We believe you will want to know us better after you try it. We want to build up a business with you.

We offer you a free generous sample. We urge you to test it thoroughly—to compare results and costs. What could be fairer? You can lose your time—but we lose our big opportunity to win your confidence. We don't want either to happen. You can win and we can win! Let's take a chance!

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Dye Color Formulas for Wood Novelties

A leading authority on colors and dyes suitable for use in wood finishing, reveals a number of valuable formulas and specific information on this interesting subject

By The Colorist

THE APPLICATION of dyes to the coloring of wood novelties is one of the most interesting phases of the "wood dyeing" industry. One does not easily conceive the variety of dyes employed in this type of work. Discrimination is necessary in the selection of each color for each specific novelty or toy to be colored.

The classes of dyes most commonly used are the acid and basic. The acid dyes possess greater fastness to the light than the basic colors, but the fugitive basic dyes have greater coloring potency and penetration.

I shall take each shade separately and point out the dyes or combination of dyes most frequently used in the making of the named shade. In making my recommendations, I am taking into consideration solubility, coloring power, penetration and general money value of the dyes.

Grays and Blacks

Various manufacturers use different classes of dyes in the making of these shades; but the following are the most popular and valuable.

Acid Group

Formula No. 1

Water soluble nigrosine jet.....2-lbs.
Solvent, water.....12-gal.

Formula No. 2

Napthol blue black, 10B....1-lb. 6-oz.
Orange Y.....10-oz.
Solvent, water.....12-gal.

Basic Group

Formula No. 1

Spirit soluble nigrosine jet.....1-lb.
Solvent, denatured alcohol....12-gal.

Formula No. 2

Bismarck brown R S.....8-oz.
Malachite green.....4-oz.
Methyl violet 5B.....4-ozs.
Solvent, either 12-gal. of alcohol or 12 gal. of water. A mixture of alcohol and water can also be used. The quantity of alcohol employed is governed by the amount of penetration wanted.

Direct Group

Formula

Direct black ex.....2-lbs.
Solvent, water .....12-gal.
(See note in summary.)

It is quite obvious that there are a great variety of blacks to pick from, but this does not necessarily mean that any black will do for any purpose. For instance—when real fastness to light is wanted, direct black is appropriate. If fair fastness to light is wanted, the acid dyes would meet the requirements. If no light specifications are made, basic colors are the best.

In order to make gray shades the quantity of color recommended for the blacks may be reduced until the desired shade of gray is obtained.

Browns; Basic Group

Formula No. 1

Bismarck brown, YS or RS.....1-lb.
Solvent, water or alcohol.....12-gal.

— *one of these*
IMPERVIOUS PRODUCTS
to fit your specific need

Baking Enamels and Japans
Finishing Varnishes
Protective Coatings
Pyroxylin Lacquers

UNIFORMITY — QUALITY — PERMANENCY

An Impervious Varnish, Japan or Lacquer is especially made for a specific purpose for finish on Iron, Steel, Aluminum or Wood

We maintain a complete and practical baking, spraying and finishing department with trained operators for demonstrating and to assist in solving problems of baking, spraying or finishing your own products.

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Manufacturers Industrial Finishes

General Office — 421 Wood Street
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Formula No. 2

Chrysoidine, YS .....9-oz.
Malachite green.....½-oz.
Methyl violet 5B.....½-oz.
Solvent, water or alcohol.....12-gal.

Formula No. 3

Chrysoidine, YS.....14½-oz.
Spirit soluble nigrosine blue..1½-oz.
Solvent, alcohol.....12-gal.

The alcohol solution may be diluted with water only after the color is in complete alcoholic solution.

If the Bismarck browns are too dull and red, the colorist can add a small quantity of chrysoidine, but on the other hand, if a duller shade is wanted, the Bismarck browns can be shaded with malachite green and methyl violet, 5B.

Browns; Acid Group

W. S. nigrosine blue.....14-oz.
Orange Y .....16-oz.
Azo rubine conc.....2-oz
Solvent, water.....12-gal.

If a yellower shade of brown is wanted, metamil yellow can be substituted for the azo rubine concentrated.

Water Soluble Mineral Colors

Water soluble brown, light and dark, give good fast to light shades of brown; these dyes can be easily shaded with acid colors to produce various shades. A good staining solution of the color can be made by dissolving 5-lbs. of water soluble mineral brown L or D in 12-gal. of hot water.

Now let us turn to the bright shades.

Reds and Pinks

Formula No. 1

Safranine, magenta, rhodamine BS
Solvent, 1-lb. of the above dye may be readily dissolved in 12 gallons of water. Alcohol solutions of magenta and rhodamine BS can also be made.

Formula No. 2

Rhodamine BS.....4-oz.
Auramine conc.....4-oz.
Solvent, water or alcohol.....12-gal.

Acid Group

In formulas, 1 and 2 of reds and pinks, the rhodamine BS and the mixture are the brightest and most expensive. Safranine gives a bright shade of red or pink with a good penetration. Magenta has the greatest coloring strength and penetration, but this dye is very easily dulled on account of its sensitiveness to acid.

Acid Group

Lake scarlet, croceine scarlet.
Either color.....2-lbs.
Solvent, water or alcohol.....12-gal.

Both of these dyes are very popular because of their good solubility and fair fastness to light. For pinks the quantity of color can be reduced until the desired depth of pink is obtained.

Orange; Acid Group

Orange Y.....1-lb.
Solvent, water.....12-gal.

Orange; Basic Group

Chrysoidine YS.....1-lb.
Solvent, water or alcohol.....12-gal

Note: If light specifications are made, orange Y. can be substituted for chrysoidine YS.

Yellow; Acid Group

Tartrazine conc.....2-lbs.
(or Napthol yellow.....2-lbs.)
Solvent, water.....12-gal.

Yellow; Basic Group

Auramine conc.....1-lb.
Solvent, water or alcohol.....12-gal.

Note: If light fastness is a requisite, napthol yellow can be substituted for auramine concentrated.

Green; Basic Group

Formula No. 1

Malachite green.....8-oz.
Solvent, water or alcohol, either....
.....12-gal.

If extreme brightness is desired, the malachite green can be shaded with auramine concentrated.

FILLCOTE
FILLCOTE is an improved non-pigmented first coater for use under varnishes. Many large furniture factories are standardizing on FILLCOTE as a quick building coater, that has distinct advantages over the use of shellac and shellac substitutes.
FILLCOTE is particularly suitable for use on walnut, mahogany and other close grained woods, and on porous woods that require a good heavy building coater. Where shellac and shellac substitutes have a tendency to raise the grain FILLCOTE produces a perfectly smooth surface.
FILLCOTE costs less than shellac and it saves time by eliminating much of the work of sanding. Its quick drying properties tend to speed up production.
Write for working sample or for demonstration.

MAYER & LOEWENSTEIN

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Formula No. 2

Malchite green .....6-oz.
Chrysoidine YS .....2-oz.
Solvent, water of alcohol, either....
.....12-gal.

If extreme brightness is desired, the malachite green can be shaded with auramine conc.

Green; Acid Group

Formula

Acid green G.G. conc.....2-lbs.
Solvent, water .....12-gal.

This dye can be substituted for the fugitive malachite green, if fastness to light is a requisite.

Violet

The most suitable dye for this shade is methyl violet 5B. If a bluer shade of violet is wanted, the colorist can shade the aforementioned dye with malachite green. The dye solution can be made by dissolving 8-oz. of dye in 12-gal. of water or alcohol.

Blue

Formula No. 1

Victoria blue BX.....8-oz.
Solvent, water or alcohol.....12-gal.

Formula No. 2

Methylene blue conc. .....8-ozs.
Solvent, water .....12-gal.

Both dyes give bright shades of blue, the Victoria blue BX being the redder of the two.

Summary

All the dyes may be applied by brush or by dipping.

In the case where the direct black is employed, the following method is used advantageously. Warm the solution to 120-deg. F.; then allow the article to soak in the dye until the desired depth of shade is reached.

If any difficulty is encountered in dissolving basic colors in water, the following method may be used. Allow the color to soak in one pint of acetic acid, then dilute color up to 12-gal.

Do not mix basic dyes with acid or direct colors, as they precipitate one another out of solution.

The novelties or toys may be finished by tumbling with canauba wax or by dipping them in transparent lacquer. The former method is generally employed by checker, spool, and golf-tee manufacturers.

In concluding his article the author hopes that he has convinced the reader that the coloring of novelties requires a diversified usage of dyestuffs.

Many manufacturers have found that experienced men, coming from the outside and taking an entirely new viewpoint, are often able to make valuable suggestions.

Duco Refinishing News

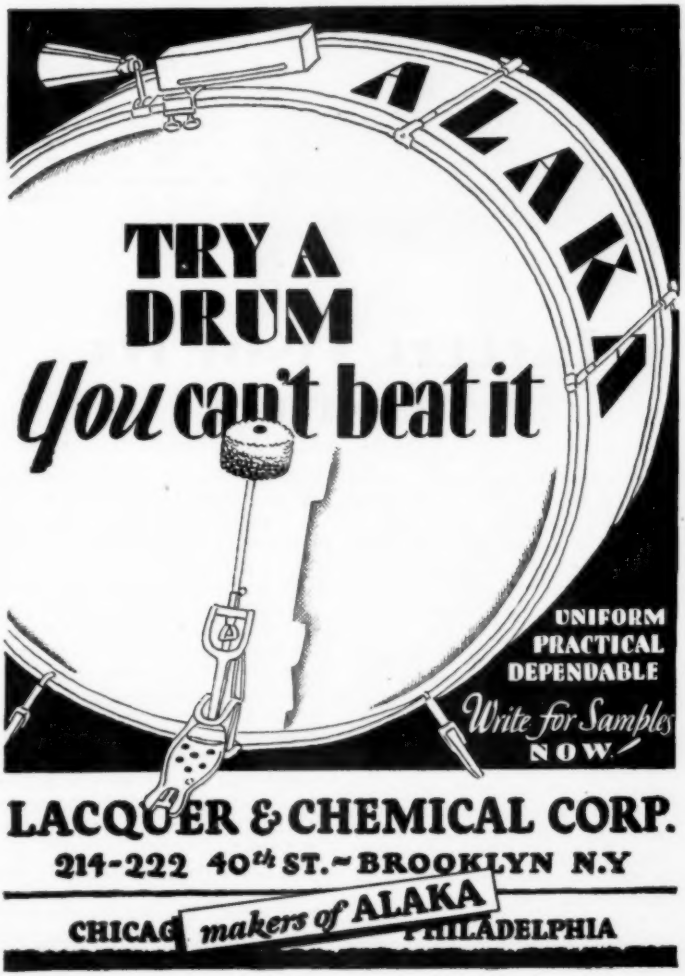
The first number of "The Authorized Duco Refinisher News" has just been issued by E. I. du Pont de Nemours & Co. The publication office is in the General Motors Building, Detroit. Among the features of the initial number is an article of "1928 Color Trends," which gives in detail the most popular color combinations to use in the refinishing of different types of cars. A selection is devoted to furniture refinishing.

Automatic Thermostatic Control

For those interested in the possibilities, application, installation and operaton of thermostatic control devices for industrial processes, The Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill., is sending out a binder containing several interesting and constructive bulletins that describe and illustrate a large variety of practical equipment and accessories for this purpose.

Connecticut Representative for Paasche Airbrush Co.

The Paasche Airbrush Co., 1909-23 Diversey Parkway, Chicago, Ill., announces that Henry A. Schwarz formerly of the New York office will represent the Paasche Co., exclusively in the state of Connecticut. His business address is, The Paasche Airbrush Co., 54 Dey St., New York City, N. Y.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How lacquer drys, and how the succeeding coats knit together to make what is virtually a single heavy protective film which retains its luster and withstands much severe service

LACQUER FINISH FOR FURNITURE

By Geo. Staker

FURNITURE finished in lacquer adds life and beauty to a home or office. This is an appealing feature in the selection of home furnishings. Clear lacquer, when properly applied, brings out every element of beauty in the natural grain of the wood.

A finishing material, to be properly termed "lacquer," must have as its base, liquified nitrate of cotton which imparts that toughness and durability characteristic of modern high-grade lacquer finishes. To this nitrated cotton are added solvents, extenders or non-solvents, gums and plasticizers—all properly proportioned to make a well balanced formula for the purpose intended.

Lacquer and varnish products are similar only in the respect that they are both used as protective coatings. Lacquers dry through evaporation of the volatile solvents, leaving a solid-content film-forming base which includes oil, gum and cotton. Varnishes dry by the oxidization of the oil which is fused with the gum during the process of manufacture, by the use of heat.

It is true that there are false-bodied lacquers on the market today, but in all probability, the average lacquer is built of true film-forming materials that produce the desired results expected of a high-grade lacquer. This feature, in addition to the quick-drying qualities, length of life, maintained high luster, etc., makes a lacquer finish that is especially desirable for many finishing requirements.

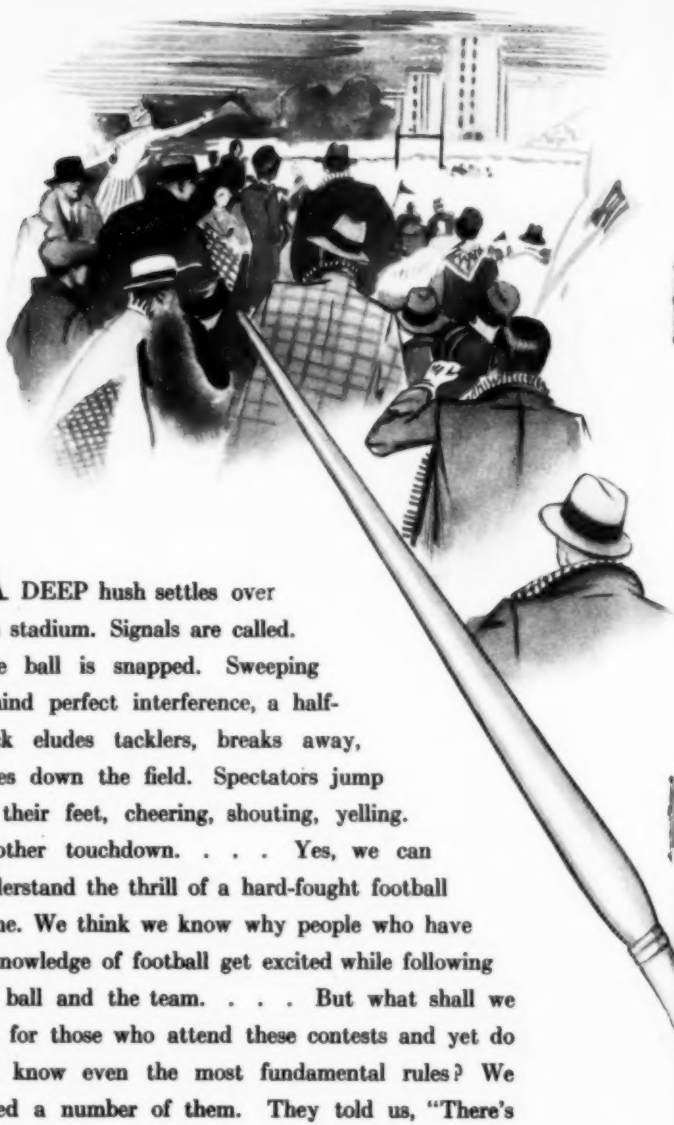
A true lacquer film will not scratch white, nor will it check as it ages. The film should withstand boiling hot liquids, soap and water, and reasonably hard service.

Characteristics of Lacquer

Lacquer finishes in drying—through the evaporation of the

THE PARADE OF COLOR

TOUCHDOWN!



A DEEP hush settles over the stadium. Signals are called. The ball is snapped. Sweeping behind perfect interference, a halfback eludes tacklers, breaks away, races down the field. Spectators jump to their feet, cheering, shouting, yelling. Another touchdown. . . . Yes, we can understand the thrill of a hard-fought football game. We think we know why people who have a knowledge of football get excited while following the ball and the team. . . . But what shall we say for those who attend these contests and yet do not know even the most fundamental rules? We asked a number of them. They told us, "There's

so much tension, so much color." The remarks of these people convinced us even more firmly than ever before that there actually is something basic and permanent in the appeal of color. . . . So, on a study of reactions similar to these, we developed a wide range of pleasing colors and re-created them in Arcozon lacquer — individual shades and hues that have won the preference of furniture and household furnishings buyers. . . . We will be pleased to show you the remarkable results of our extensive research and effort. When will it be most convenient for you to hear the complete story, along with the interesting facts of the Arco color-creating service?

WITH us, *service* is not a convenient, pretty word to be used in sweet-sounding phrases. It is the very backbone of every phase of our business. . . . In 1881, when The Arco Company first began manufacturing paints and protective products, we decided to make *quality* and *service* the foundations on which to build. This pledge to ourselves, and to those whom we serve, has never been broken. . . . These two factors will always be associated with Arco, because we believe these principles to be in accord with sound business practice. We also believe that in this manner alone can we assure our clients complete satisfaction. . . . That this policy has justified itself is proved by the fact that more and more manufacturers are adopting Arco products exclusively in their standard finishing methods.

THE ARCO COMPANY, CLEVELAND, OHIO

Paints Varnishes Enamels Lacquers

ARCOZON

THE ARCO PYROXYLIN LACQUER SYSTEM

volatile solvents—have the affinity of the film-forming content to "seep" into the pores of the wood. This sometimes is termed "pulling down." As lacquer coatings are applied one on top of another they form a continuation of the film; that is to say, if five applications are put on to make a finish, all five coatings when dried will be closely knit together, giving the effect of a single heavy coating.

The solvent content of the lacquer, when applied over an old film, will penetrate and knit with the original film. This characteristic accounts, to a great extent, for the remarkable durability of a lacquer film. Another important feature, resulting from the composition of the lacquer film, is its tendency to actually contract and expand with wood or metal it covers.

A suitable lacquer for furniture should not require the use of polish, as sometimes the composition of certain polishes is injurious to a lacquer finish. Really the friction of a dry cloth rubbed over the lacquered surface from time to time should be sufficient to keep the finish at its best.

Lacquer finishes for furniture are now manufactured which will withstand the action of alcohol as from spilled perfumes and liquors. The merit of this feature is especially valuable in the case of furniture for hotels, clubs and places where the service and usage are such as to subject the finish to damage from liquids stronger than water.

The men who are running medium-sized businesses and who are in business not only to build sales volume but to make profit will have to keep their sanity in this day of volume at any cost.

Cleanliness; Orderly Housekeeping

The finishing room should be kept clean, especially the corners and steps. All blocks and sticks used for various purposes should be kept in a certain place, out of the way, but handy to reach when needed.

The drinking fountains should be nice and clean. I believe in keeping the drinking place sanitary. A little pumice stone and water will brighten and scour all metal containers. I keep a lye barrel by the hot water tank. Every Saturday the size buckets and all cans used during the week are immersed in the lye over Sunday and will look as good as new when needed Monday.

All filler, paint and stain cans should be taken out as soon as emptied, for nothing looks worse than a lot of old cans scattered over the finishing room.

Have shelves put up to hold the men's dinner baskets, and hooks for their clothes, and see that they use them. I find that a clean orderly place makes men better workers and they take pride in their place of employment.—M. D. B.

Any economist will tell you that it's better to double your yield on a given investment without increasing the yield in greater proportion.

Richard Zeller Leaves Henry V. Walker Co.

Richard Zeller, 100 Jefferson Ave., Maplewood, N. J., announces that he has resigned as Works Manager of the Henry V. Walker Co. For the past 17 years he has been connected with the industry in the manufacture of lacquer materials, first with the Egyptian Lacquer Mfg. Co. and later with the Zeller Lacquer Mfg. Co. of which he was one of the founders.

Stains for Wood Finishing

Foreman finisher of Store Kraft Manufacturing Co., reviews some of the characteristics of various stains for wood finishing and explains how and why he uses certain ones

By E. B. Smethers

THREE TYPES of stains are now being used in the finishing room—water, oil and spirit stains. One naturally infers that a water stain is a dye soluble in water, although a few anilines are soluble in both water and alcohol. These anilines I generally avoid, especially in high-class work, as it has been my experience that they are not always fast to light.

An oil stain is an aniline soluble in oil—that is in turpentine, benzine, naphtha or such hydro-carbon compounds as benzol or toluol. A spirit stain indicates a dye soluble in alcohol.

Before the advent of lacquers, many finishers used oil stains in preference to water stains. Such colors as red or brown mahogany had to be sealed with one heavy coat or two thin coats of shellac to prevent bleeding. When furniture finished by this method was subjected to the sunlight, fading resulted, as oil-soluble-dye, fast to light, could not be obtained.

Since the introduction of lacquers, water stains have been used on the majority of exposed wood parts, as most oil stains have not proved satisfactory under lacquers.

Water Stains

In addition to the non-fading qualities of the water stains, I believe a more even and deeper penetration can be obtained because of the fact that water evaporates more slowly than other solvents such as benzine, turpentine, benzol or alcohol.

A greater variety of dyes are water soluble, thus giving a wider range of colors and making it easier to standardize formulas and match and record sample finishes. The stain coat cost in finishing is very easily figured, since only the cost of the material per pound need be known, and water is used as the solvent.

The solvents in lacquer will not affect a good water stain. Lacquer can be sprayed directly over it without any solvent action or retarding of its drying time, the color remaining clear and transparent.

If a water stain has been dissolved carefully and properly, there will be no residue left in the bottom of the container when it is emptied. Of course, if an excess quantity of color material is dissolved by boiling, it will precipitate out upon being cooled. Heat is applied only to hasten the dissolving of the dyes. At times it is a good idea to warm a stain to secure deeper penetration; especially, is this true, in the lighter tints.

Shading; Two-Toning

Shading and two-toned effects are easily obtained by spraying over the work with a weak solu-

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Numerous accounts on our books which have remained unbroken for over 25 years attest the real value of our goods and service.

We specialize particularly in Lacquers: Clear, Rubbed Effect and Colored.

And in Paragon Rubbed Effect Varnishes; Flat, Velvet and Semi-Bright.

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tion of the required stain and then shading in the desired places with a stronger solution.

The only real argument I have ever heard against a water stain is that it raises the grain or surface fibers of the wood, which necessitates preliminary sponging and sanding operations to secure a satisfactory surface. These operations are particularly important in good wood finishing. The pores are opened up and the loose fibers are removed, thereby enabling the finisher to bring out the true beauty of the wood. In my opinion, the cost of these two operations is more than offset by the low cost of the water stain alone.

Oil and Spirit Stains

Oil and spirit stains have their places in the finishing room. Both are used on the inside of cases, counters, drawers, etc., where subsequent sanding is not required. Spirit stains are also very useful for touching-up purposes.

The writer uses denatured alcohol as a solvent for spirit stains, although wood alcohol may be used. In dissolving a spirit-soluble dye, never use heat.

If a spirit stain is applied too heavy, or if the solution is overloaded, a bronze effect will result, due to the fact that the color does not penetrate with the alcohol but leaves a film on the surface. These stains must be applied rapidly, or a streaked or uneven color will result. They should be protected with shellac, but even then fading will occur when the finished surfaces are exposed to the sunlight. Care must be taken in applying the shellac; the finisher should endeavor to put it on rapidly and avoid going back over the work, as otherwise the stain will be worked up into the shellac.

Testing Finishes for Aluminum Furniture

The selection of paints and varnishes for the finishing of furniture made of strong aluminum alloy has presented problems of a somewhat different nature from those connected with their use on articles composed of other metals and wood. Aluminum, being a silvery white metal, shows a pronounced color contrast between finish and metal, if the finish is scratched or worn off. Therefore, in addition to considering the color and beauty of finish, the manufacturer of aluminum furniture must select extremely tough and durable paints, which are as resistant as possible to abrasion and chipping.

Specific information along this line—the testing equipment, methods of using it and the results obtained—is presented in a reprinted article* by A. D. Camp of the Research Bureau, Aluminum Company of America, Buffalo, N. Y., which is now available in pamphlet form.

*Published originally in Industrial and Engineering Chemistry, 706 Mills Bldg., Washington, D. C.

One form of modern heating consists of a constant stream of heated air blown out just above the heads of the workers.

James W. Elms, Dies

James W. Elms, assistant general manager of the Paint, Lacquer and Chemical department of the du Pont Co., died Oct 13, 1928, in Paris, following an operation. Mr. Elms had been traveling in Europe in the interests of the du Pont Co.

Keep Lacquer Quality

It's an old, old story that we get exactly what we pay for in most of our transactions. When dealing with reliable concerns who make finishing materials we find this to be exactly true.

It is entirely possible that some manufacturers, whose products require a lacquer finish, are working under the impression or illusion that a cheap lacquer is just as good as a higher-priced material. Price probably can never set a reliable standard and never did, but we know that price enters into most transactions and must enter into a lacquer transaction between seller and buyer.

Of course, there are a number of manufacturers who are very sensible about this price question, and who do not let every wind blow them from their course. They are trying to keep in the middle of the road.

However, when old established companies make pyroxylin lacquers to meet a competitor's price, we wonder whether or not the finish user, who is chiefly interested in low prices, may not get onto dangerous ground? If high standards in the lacquer industry are to be adhered to, they must first of all be kept inviolate by the old reliable concerns who make products to meet a standard and not a price.

I believe that, if all of the smallest as well as the largest reliable companies making pyroxylin lacquers would refuse to go into the cheap competition, those that persisted in making price the issue would eventually learn a costly lesson.

It seems to me that now is the time for the reliable manufacturers of lacquers to make a campaign throughout the industrial trade, informing the lacquer users of the fact that cheap lacquers cannot give permanent satisfaction, and that in many cases they may spell disaster.

Unless the ultimate consumers of lacquer know that cheaply formulated lacquers seldom give satisfaction and are not "just as good" as some concerns try to lead us to believe, they cannot be blamed for buying the inferior grade of material because it costs less money.

The way to keep the lacquer industry on a firm foundation is to keep it on a quality basis. Unless we do this, consumers of lacquer will find no satisfaction in the cheap lacquer and they may be encouraged to revert to other types of finishing materials.—J. C. Hertstein, Jr.

Rubbing Finished Surfaces

When rubbing a finished surface many finishers have the habit of using too much cutting medium. The best results are obtained by using a sufficient quantity of oil or water with but little pumice or rottenstone. When too much pumice is used, a hard mass forms under the pad and this merely slides over the finished surface without cutting.

When too much rottenstone is used, about the same effect occurs, but instead of polishing the surface, the rottenstone has a tendency to dull it. The use of less pumice and more oil or water will help bring up the polish. Oil brings up a higher polish than water, but it cuts more slowly. Rubbing compounds, made in different grades by well known concerns, are really better and quicker than pumice and rottenstone—and in the end they are cheaper.—J. M. Verderosa.

The whole paint industry is turning to the appeal of color as something fresh and popular.

Rust—Preventive Finishes

Explaining specific information about rust, why and how it forms and what finish coatings have been developed to prevent the formation of rust on metal products

By L. F. Worlendar

SEVERAL theories have been advanced as to the cause of corrosion or rusting, but it is now an accepted fact that it is dependent largely upon "auto-electrolysis," that is, electrolysis due to currents set up between different parts of the material itself. In other words, it is not necessary that an external source of electricity be provided before electrolysis can take place.

These small currents require the presence of an electrolyte to serve as a conductor and thus complete the electric circuit. The moisture in the air is sufficient to close the circuit and start corrosion. Once the circuit has been closed and the small currents start flowing, the oxygen of the air attacks the iron and forms the basic oxide of iron, commonly called rust.

What Rust Does

All investigators are agreed that iron cannot rust in air or oxygen unless water is present and, on the other hand, it cannot rust in water unless oxygen is present. The problem of protecting iron or steel, then, resolves itself into one of applying coatings which will prevent moisture and oxygen reaching the surface of the metal.

A protective coating prevents corrosion just as long as it remains a dense, perfect coating, excluding all moisture. But as soon as it begins to break down, and pinholes, cracks or checks allow moisture to penetrate, rust starts and spreads under the coating.

Once rust is started it will continue to grow even though later coated over with a protective film, for it possesses the peculiar property of using over and over again the same water and oxygen to form new rust. For this reason it is very important to have metal clean and free from rust before starting to paint.

Protective Finishes

If finishing material manufacturers could develop an absolutely moisture-proof finish it would appear, at first thought, that such a finish would indefinitely protect surfaces on which it is used. It is doubtful, however, if such perfection will ever be reached because so many factors, over which the finishing material manufacturer has no control, are constantly fighting the finish.

Finishing materials are applied to prevent the weather and other destructive agencies from destroying the surface to which they are applied. In other words, the protective coats act as soldiers, who must fight the elements constantly to give immunity to the surface over which they are applied. In carrying on this fight, naturally the protective coatings must be

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affected to a certain extent and consequently cannot last forever. This is the reason that color varnish, finishing varnish and enamels are so quickly destroyed.

Finish Defects

The most common form of deterioration in the old paint and varnish days was checking, cracking or crazing. This was due usually to the top coat of finishing material being oxidized more completely than underlying coats, with a consequent loss of elasticity. During exposure to rain or other dampness, the film of finishing material absorbed moisture, swelled and softened. If subjected to cold weather under such conditions, the tendency of the film to contract was opposed by the tendency of the moisture to expand as it turned into ice, and severe strains resulted.

Later, upon exposure to sunlight, regardless of whether the finish had been subjected to low temperatures, the outer surface dried first and contracted as it dried, setting up stresses and strains much as when a sheet of rubber is drawn tight over a surface. If the finish was not sufficiently elastic, the strains caused by either of the above conditions might be severe enough to rupture the finish and cause checks and cracks through which moisture and other agencies could attack the undercoats.

Most paint and varnish materials have a tendency to dry from the top down, that is, they will harden on the top within a few hours and yet be more or less soft underneath, requiring considerable time before they are hardened through the entire thickness of the coating. If another coat is applied before this oxidization or drying has proceeded far enough, or if too heavy a coat is applied, the top film begins to harden first and soon forms a layer which prevents the oxygen from getting to the bottom where the material is only partially hardened.

If the finish is subjected to a change in temperature at this time there will be an expansion or contraction of the metal and the finishing material will have to expand and contract also. Now the portion of the film which is not thoroughly dried will expand and contract over a greater distance without breaking than will the hardened top film. As a result the top film will be broken and checks or cracks will appear.

Temperature Changes

Not only will this happen with any great or sudden changes in temperature, but there is also danger, under the above mentioned conditions, of cracking and checking taking place, due solely to the fact that as the undried portion of the film finally becomes hard and dry, it will shrink in volume ever so slightly. Since the top film is already hard and dry it may not be sufficiently elastic to change shape with the under portion, and will be broken in pieces.

This condition is illustrated by the familiar example of the drying mud under a hot sun on a river bank. The top of the mud dries first and becomes very hard, shrinking in volume as it dries. Later as the drying proceeds downward, the top film of mud is no longer sufficiently elastic and it cracks into sections of irregular size and shape, the cracks becoming larger and deeper as the drying proceeds.

In addition to the defects just mentioned, the old form of paints, varnishes and enamels had another serious drawback—the

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length of time necessary for the various coats to dry. In an effort to overcome these difficulties, the modern nitrocellulose lacquers were developed.

While a properly designed and properly applied lacquer finish is one of the fastest and most durable finishes that can be produced, the working conditions, construction of the coach, service conditions and other details must be such as to harmonize with the use of lacquer, if a permanent finish is wanted. In other words, lacquer is not a cure-all; there are certain conditions such as on automobile bodies where it is an ideal finish, but there are other conditions such as on bus bodies, street cars, railway coaches, etc., where it is not so satisfactory.

Composite construction wherein exposed wooden members must be finished the same as adjacent metal parts, loosely attached mouldings, and long wheel-base equipment present severe tests for any finishing material. Considerable weaving and straining at joints takes place when such equipment is driven around curves or over rough road beds and these stresses are likely to produce cracking around the mouldings, bolt heads and joints. In addition moisture may get into the wooden members and cause them to swell.

For the continuation of this subject see article in next month's issue, entitled "New Finish for Railway Equipment."

Distribution of Heat

The question as to whether radiators or steam pipes, placed in long rows, should be used in the finishing room, has many arguments. If steam pipes are used it is best to place them along the wall quite close to the floor. Good radiation with uniform temperature and comfortable conditions for the workman can be obtained in this manner.

It is true that pipes placed overhead are out of the way, but so placed they are very hard on the workman and it is much more difficult to keep the room at a uniform temperature. If it is necessary to put pipes overhead, place them along the wall above the windows; not directly over the men's heads.

Radiators placed at equal distances along the wall usually furnish satisfactory heating. By this method, the actual number needed to hold the required temperature may be used during the day.—E. B. Smethers.

The instantaneous and peremptory perception of beauty is the surest sign we have that something is right and true, as the shock of the ugly is the most certain warning that something is false and in the highest sense unreal.

Industry's Coat of Mail

This is the title of a new booklet issued by Berry Bros., Inc., Detroit, Mich. The new booklet describes and illustrates several uses for the company's aluminum paints which, according to the announcement, are finding new uses every day. For example, one use is for sealing old finishes where mahogany stains have been used.

Testing Finishing Materials

An interesting bulletin called "Circular A" and published by R. P. Cargille (products for scientific laboratories), 26 Cortlandt St., New York City, describes, illustrates and tells how to use "R.P.C." viscosity tubes in testing the viscosity or "body" of varnishes, lacquers, oils and other finishing materials. The bulletin also lists other small equipment and supplies useful in making tests.

Panel by Pearl City Veneer Co.

LACE WOOD — Is sometimes called Selana. (Australian Red Oak) comes from Australia. Used for inlays, overlays and other decorative purposes.

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Paris Auto Salon Colors and Finishes

Specific information about the automobile colors, finishes and styles exhibited at the Paris Automobile Salon, as cabled by the representative of E. I. du Pont de Nemours & Co.

By P. H. Chase

THE TENDENCY toward brighter colors and a more elaborate decoration of cars, already noticed last year, is more accentuated than ever at this year's Automobile Salon, in Paris, France. Cars are being shown here from all the important countries of Europe. European manufacturers have taken a leaf out of America's book and have followed the lead which it has given them in the application of color to finish.

While in old days one could buy a car in only one or two specified colors unless a special decoration was paid for, purchasers even of such current types of cars as Citroen can now have the choice between at last six schemes of colors; if they wish to pay a little more, they can have the car finished in whatever shade they please. The interest of car manufacturers has become such that they insist on having special colors prepared for their exclusive use and not to be furnished to other concerns.

Fashionable Colors

Although all the range of the rainbow is to be seen while walking through the Automobile Salon, the predominating colors and those which have the vogue seem to be at present the greys and beiges, while an attempt seems to be made to launch green. Besides these ranges of colors, black seems to be fashionable for town cars with a colored belt relieving the sombreness of the ensemble.

Although some cars are still being painted by hand, most of the manufacturing concerns are using lacquer finish sprayed on by modern methods. The use of the Weymann body, which was once rather widespread here and which was a feature of last year's Salon, appears to have greatly decreased. This type was covered with fabric instead of the usual paint or lacquer. There is certainly not more than 10 to 12 percent and probably less of the cars shown which have a Weymann body and of this number, more than two thirds are with the new Weymann pyroxylin coated fabric with a smooth finish which is called in French "tole souple."

Interiors; Tops; Wheels

Car interiors are mostly upholstered with fabrics, the general tone of which is gray or beige either plain or with designs matching the color of the car. There is a tendency to have the front seats of cars, especially if they are to be used with a chauffeur, upholstered in lacquered fabrics in colors matching the outside. One or two cars are upholstered in velvet, but this seems to be a lone attempt.

The tops of cars are mostly colored, there being about 70 per-

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cent of colored tops as opposed to black. Automobile trunks are generally covered with lacquered fabric matching with the color of the car. Although a few cars have tire covers in imitation leather matching the color of the car, the immense majority seem to have their spare tires in black.

Disc wheels are more and more in evidence, sometimes finished with one of the colors used on the cars and sometimes showing a plain white metal appearance. The general scheme of decoration is to have a car all of one color with a belt of different color running the length of the body and prolonged on the hood but narrower, or again to have the lower part of the body and the hood of one color, the upper part and the belt still prolonged of a different color. Narrow striping on the belt and sometimes on louvers is used. Fenders and chassis are generally black.

Typical Color Schemes

The two stands attracting most attention, due to the fact that the concerns which are exhibiting sell low-priced cars, are Citroen and Renault. Citroen has new six cylinder cars attractively decorated. One is dark green with a black belt prolonged on the hood and carrying narrow red striping, while the windows are framed with red stripes. Another is finished in dark greenish gray with an Amaranth colored belt carrying narrow cream striping.

One of the Renaults has the body, the hood and the frame around the windows in light beige while the upper part of the body, the belt, the fenders and the balance of the chassis are of the same color in a darker shade. The belt is prolonged on the hood carrying two white narrow stripes.

An attractive although sedate De Launay Belleville is in gray very slightly tinged with green, with a gray belt and disc wheels with circles of both colors. Voisin is showing cars mostly of a yellowish beige. A well known body maker is displaying a car in black with a red belt and carrying two narrow beige stripes. Another example of a black car is a small town car edited by Vandenplas. It is all black with mouldings of aluminum color and a beige freize underneath each window.

Binder shows a Minerva, the lower part of the body, the window frames and the hood being finished in beige tinged with yellow green with a gray belt. The disc wheels of the car keep a metal appearance. Still another body maker, Millonguiet, shows a greenish grey American car, the belt of which is composed of two dark blue mouldings, the lower part being prolonged on the hood. Wheels, metal discs and fenders are dark blue.

The fashion for colors is not confined to Paris but has also invaded the rest of France, since a famous Lyons body maker shows an attractive Hispano cabriolet limousine in blue with a black belt of the same width its whole length, even on the hood, and carrying two narrow gold stripes. The top, wheels and fenders of this car are black, while the interior is upholstered in a fabric with a lizard-like effect.

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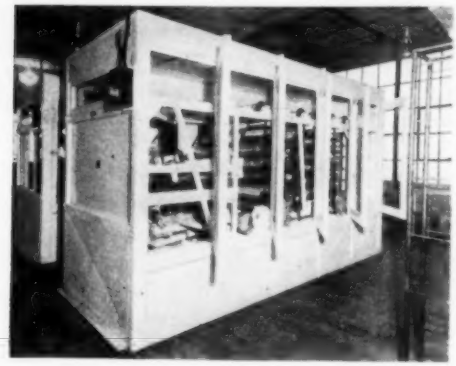

Vice-President and Chief Engineer of Weber and Scher Mfg. Co., Inc., (Special Machinery) discloses some interesting information about mechanical dipping and conveying equipment for lacquering small parts in large quantities*

LACQUER DIPPING AUTOMATICALLY

By Auguste L. Saltzman, M. E.

OWING TO increasingly competitive conditions, most manufacturers who lacquer their products are faced with this complex problem: To increase production with fewer and less-skilled operators, at the same time obtaining products of uniform appearance, and consuming the least possible quantity of coating material.

If the parts are to be wholly surfaced, and do not require more than one coating of a not-too-dense lacquer, the solution of the problem lies in the dipping process by automatic equipment. This is being verified in a rapidly increasing number of plants where the value and economy of the dipping process have been recognized by the installation of automatic dipping machinery.

Automatic Equipment

This automatic equipment has superseded, to a great extent, the crude dipping devices formerly used. In the dipping process:

1—The human element is not a vital factor in surfacing, so a skilled operator is not required.

2—There is no loss of time or material in keeping the equipment keyed up to its best performing condition.

3—A predetermined output on a mass production basis is assured.

4—A great number of pieces can be treated per operator.

The following brief description is typical of the latest development in the mechanical means employed in dip lacquering:

Each machine is a self-contained unit, being completely incased in a housing of steel, with wire-glass doors. Exhaust outlets for fumes are provided in the roof of the structure, and thermostatically-controlled fire-smothering apparatus is suitably arranged to take care of the fire hazard.

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and many other products are like toys, in this respect, for the lines with a beautiful, lustrous finish are the ones that sell—the finish is the salesman.

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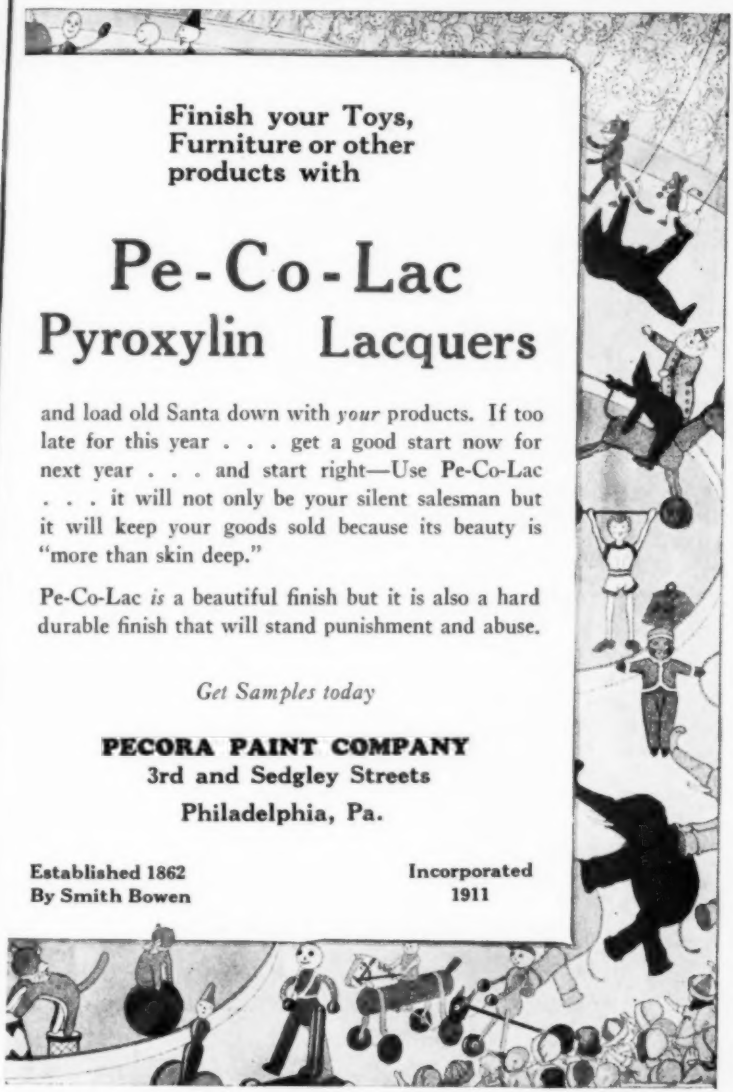

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Features of Mechanism

The mechanism is mounted in and upon a rigid and vibrationless structural steel frame, and is operated by a vapor-proof induction motor, which drives a variable-speed transmission unit. The transmission unit drives, through suitable devices, a pair of parallel endless chains between which are racks, detachably supported, which carry the parts to be lacquered.

The housing is provided with openings at both ends, one for loading and the other for unloading. The lacquer dipping tank is located adjacent to the loading end.

The parts are carried through the lacquer, at a suitable constant speed, for a brief immersion; then they are raised at an angle best adapted to be in accord with the natural flow of the coating material, thereby avoiding any mottled and wavy coating.

Traveling, Drying

The travel of the parts after emergence from the tank is toward the unloading position at the rear end of the machine, the route of travel being a series of upward and downward flights which occupy a time period sufficient to insure thorough drying of the parts before they are subjected to handling. This travel period is usually 20 to 30 minutes for air-drying lacquers, and can be changed to suit conditions.

Steam piping is sometimes installed between the travel flights, to intensify the drying process and condition the surrounding air.

When baking is desired, the work-carrying racks are automatically transferred to suitable ovens.

A loading operator at the front end of the machine, and an unloading operator at the rear, constitute the usual crew.

The racks for carrying the parts are of skeleton construction, and are designed both for rapid loading and for holding the parts in such angular position as best secures proper drainage. They are portable and may either be loaded while being carried in the machine, or previously-loaded racks may be delivered at the loading end of the machine.

When the number of parts per rack does not exceed 20 and when the parts are easily mountable, the loading is done by the machine operator while the racks pass slowly upward past the front opening in the housing. When each rack carries more than 20 pieces, the loading is done by racking operators, adjacent to the machine, and the loaded racks are delivered to the conveying chains.

Unloading Operation

The unloading operation can usually be performed by one person, and it takes place during the last downward flight of the travel route. When each rack carries a small number of parts, this operation is effected while the work is passing the opening in the rear end of the housing; the unloaded racks, remaining in their carriers, are then conveyed to the front end of the machine where they are again loaded during their first upward flight of the next travel cycle.

When the pieces per rack are greater than can be unloaded during the last downward flight, the racks are taken from the machine, the parts then removed and the racks are delivered to the rackers for reloading.

On a 12 to 15-piece-per-rack basis, the eight-hour output of such a machine approximates 18,000 to 20,000 pieces, with only two oper-

ators. Obviously, other conditions being equal, an increase in the number of pieces per rack proportionally increases the productive capacity of the machine. Some machines of this type are now treating as many as 10,000 pieces per hour.

The density of the lacquer mixture is another factor governing the rate of output, because the heavier the lacquer the slower must be the speed of travel as the parts merge from the lacquer, and the longer will be the drying period. The variable-speed mechanism and the adjustment in the angle of emergence are adapted to meet the various requiremnts.

Machines of the type described are mainly constructed from standardized parts, but their length, height, tank size and capacity, and the spacing between rack supports, are determined by individual conditions, the machines being built to any suitable size. Racks should be especially designed for each part to be treated, both to obtain rapid loading and proper surface drainage from the work. A variety of racks adapted for different parts may be operated in one machine within its maximum piece-size limitations.

For Quantity Production

It is obvious that these dipping machines are particularly advantageous in connection with large quantity production. If the total number of parts to be treated is small, and covers a wide range of sizes and shapes, this equipment and system of finishing would probably be too expensive.

The illustration at the beginning of this article shows one of a battery of automatic machines of the type just described, in the plant of Gillette Safety Razor Co., Boston, Mass. Three such machines in this plant have a combined daily capacity of over 150,000 razor parts and accessories, and are operated by girls in the finishing department.

Benches are provided for the racking crew, who load the parts and transfer the loaded racks to the machines. Unloading, inspection and traying is done by another crew. In some cases as many as 100 pieces are carried on a single rack, for simultaneous treatment.

The highest standard of finish is required by the Gillette Company, not only for the mirror surfaces of the outfit case, but for the component razor parts, and the equipment is ably maintaining this standard.

One of the largest installations of machines of the type described consists of five units which treat probably the greatest number of lacquered parts in the world, from a pieces - per - operator - per - hour standpoint.

The aim in the development of the automatic dipping equipment is to remove, as far as is possible, dependence upon the human element for quality and output.

A Problem, An Expert, A Solution

Several weeks ago our company received the greatest set-back on finishes that we ever had, though we had many before—all being small.

A salesman—a good friend of our purchasing agent—came in on his regular call and, of course, finishes was the topic of discussion. Naturally enough, the discussion brought up the recent set-back and the salesman asked to see some of the work finished. He saw it and requested permission to return on the following Friday with an expert finish man

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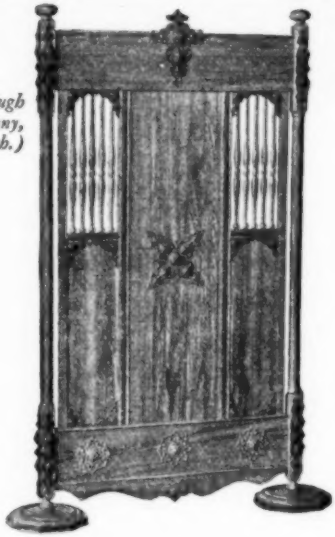

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Our Service Department conducts continuous experiment and research in order that the high Egyptian standard may be unfailingly maintained. The staff of that department will be glad to consult with you on any unusual finishing problems; write us as fully as possible, or ask a man to call.

Any special color "prescription" you may need, will be promptly and accurately filled.

HE EGYPTIAN LACQUER MFG. CO., INC., 90 West Street, New York

Completely equipped branches in charge of practical men *are maintained in the following cities:*

Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, High Point, N. C., Kansas City, Los Angeles, Philadelphia, Portland, Ore., Salt Lake City, San Francisco, Seattle, St. Louis

EGYPTIAN Lacquer

"It's A Poor Day When I Don't Sell SANDSEAL"

That's what one of our salesmen says about this new product in the wood finishing field.

Sandseal is a general utility product for use wherever a quick-drying, free-sanding sealer and surfacer is desired.

It Sands — With remarkable freedom and ease within a very short time after application.

It Seals — Over stain or filler or bare wood. Is an excellent body builder under either Varnish or Lacquer coatings.

QUALITY—SPEED—ECONOMY

MARIETTA PAINT & COLOR COMPANY
MARIETTA, O. HIGH POINT, N. C.

MARIETTA WOOD AND METAL FINISH SPECIALISTS

to see if he could not help us on the problem.

The week passed without anything of note happening, save that when the factory superintendent learned an expert finisher was coming to try and solve the problem in the finishing department, he declared with considerable profanity, "He will only be in the way and we will lose the time of our men in that department while he is here. I don't see why in the H—— he don't get a job and go to work if he is such an expert." Nothing further was said.

Friday came and the expert finisher showed up. The purchasing agent, expert finisher and salesman immediately went to the finishing department; the expert picked up one of the finished products and looked it over. An interval of silence followed. All those around him stood by expectantly, as if looking for the expert to pull some miraculous feat or perform some magic to make the finished surface look like it should.

Instead, they heard him ask, "May I have about a half pint of machine oil, a piece of burlap sack and a clean rag?" These articles were produced promptly. Then he pulled from his pocket a small package bearing a price mark of 5c—one lone nickel; it was pumice stone.

He poured a small quantity of oil in a tin lid, and in this oil he placed a good tablespoonful of powdered pumice stone, mixing it thoroughly in the oil. Then, taking the piece of burlap, he dipped it in the oil-pumice compound, wrung it out and started to rub the finished surface.

Then the magic started. Where previously there were varnish runs, they disappeared, and where formerly the stain was darker in places, it took on a uniform shade as if by magic. The finishing problem was solved.

Now, this company is keeping pumice stone and oil in stock for this purpose and it is estimated that as a result of solving this simple problem, the firm will double its sales in a year, to say nothing of the saving in poorly finished chairs which formerly were returned.

Now I ask you, "does it pay? did it pay this company? would it pay you?" to have an expert come into your plant, look over your production problems and then solve them for you?—P. C. D.

We are in the midst of widespread activities concerned with the introduction, exposition and promotion of new styles and fashions in furniture and decoration, which are featured by innovations in designs, unique applications of finish and heretofore unknown combinations of color in every shade and tone.

Made *free* from gum

Auto Lacquers

Of Dependable, Superior Quality

We have been manufacturing for 70 years at Newark, N. J.

Chas. Cooper & Co.

10 Mulberry St. New York, N. Y.

Works: Newark, N. J. Established 1857

RAUX ESTER GUM RESINS

	M.P
Rosin Ester Gum	115°C
Congo " "	135°C
Manila " "	140°C

Gums cut, fused or treated to meet individual requirements.

ROBERT RAUH, Inc.

480-490 Frelinghuysen Ave. Newark, N. J.

ALCOHOL WATERED?

Describing a peculiar trouble that developed when using substitute shellac thinned with high-proof alcohol, and revealing the real cause for the appearance of water on shellaced furniture tops

By Jim Marshall

THIS HAS nothing to do with the merits or demerits of the Canadian plan of dispensing liquid refreshments, the Volstead Act, nor politics. It does deal with alcohol however.

Some time ago, while visiting a finishing room, the foreman told me that he was having trouble with water in his alcohol. I had heard of a few of the boys who could tolerate a little water in their alcohol but most of them want it straight. Here was a case where water had gotten in sure enough and it was causing trouble.

Trouble Develops

The trouble began when the spray operator started to use alcohol from a ten-drum shipment that had just been received. This material was supposed to be Rossvill's 190 proof No. 1, Formula C. D. Alcohol.

The operator was using a good grade of substitute shellac and by the time the helper had placed the case in the drying space, the substitute shellac began to turn white and there was water on top of the case. As soon as this trouble started the second drum of alcohol was tapped, a new bucket of material was mixed and still the water appeared.

Hunting the Cause

Air lines were thoroughly inspected, air-line filters were cleaned, and a third drum of alcohol was tried; still they found plenty of water on the tops of the freshly-coated cases. This seemed to prove that there was water in the alcohol and the agent who sold the alcohol was called in to explain.

A Chemist's Idea

This man was puzzled. He checked the air lines and tried another batch of material cut with alcohol from the fourth drum; he also got water on the top of his case. He then called in an associate who was a chemist. The chemist suggested that instead of containing water, the alcohol might be of such high proof that *it condensed moisture from the air* by its rapid evaporation.

This was a new idea indeed, and to test the theory a batch of material was cut with alcohol of a lower proof. A case was sprayed and no water appeared. That brought on much conversation and more experiments until it seemed evident that the chemist was correct in his diagnosis.

The Watchman's Suggestion

These trials and experiments had taken up the afternoon and just about quitting time the night watchman passed through the finishing room on his way to punch his card "in" on the time clock. This wise old owl listened to the conversation for a few minutes and then said:

Don't gamble with "cheap" lacquer . . . It beats you every time

A "low-priced-per-gallon" lacquer must necessarily be made of cheap materials . . . stinted on the vital, expensive elements . . . poor in colors. That is the *only* way to keep the price down.

And that cheapness is *bound to show up* . . . to "chalk" the finish . . . to bloom and blush . . . make it "lack lustre" and "scummed over" looking.

Such finishes make merchandise hard to sell and stay sold, at even a low price. Those who do buy are dissatisfied with its "short life."

Opex Industrial Lacquers are made from finest materials under the watchful care of our master scientists . . . and their *superior quality* "speaks out" in the beautiful finish you obtain.

Nothing is used in Opex that is injurious to the health, no film scrap or residual solvents. There are many brands of lacquer on the market that are cheaper than Opex but you find the quality of "cheap" lacquer is cut more than the price. The reputation, resources and specialized experience of the Sherwin-Williams Co. are completely represented in Opex!

Opex "quality" finishes are the sound basis for the prosperous growth of your business.

Don't forget, too, the Opex Lacquers cover better, last longer, go farther, and work much more easily. . . . They reduce shop expenses. . . And so make profits mount even higher.

THE SHERWIN-WILLIAMS CO.

Cleveland, Ohio

SHERWIN-WILLIAMS

LACQUERS ENAMELS OPEX LACQUERS

The Sherwin-Williams Co.,
407 Canal Road, N. W., Cleveland, Ohio
Please send me complete data on Opex Industrial Lacquer
Name..... Business Title.....
Address..... .....City.....State.....

"Don't you birds know that this is dog days and that it has been rainy and drizzling for a week straight. I'll shut all these windows and turn on the steam tonight and in the morning everything will be Jake."

He did that and sure enough they had no trouble the next day. The fact remains however, that the chemist was right in his claim that the water came from the air in the finishing room rather than from the air-line or from the alcohol. After the air in the finish-room and the uncoated cases had been heated to the same temperature, there was no more sweating of the freshly sprayed cases.

Manufacturing progress and the open mind are synonymous.

For Over 40 Years

BESECO - LACQUERS

Have Stood the Test of Time

Nitro-Cellulose Solutions of all Kinds.

Bloomfield Chemical Co.

Works — Harrison, N. J.
P. O. Box 233 — Newark, N. J.

Cooper's Combined

LACQUER

A Paint Varnish Lacquer **For** Brush Dip or Spray

The Three combined in One

7 - Primary Colors - 7

From which all shades may be made

Chas. Cooper & Co.

10 Mulberry St. New York, N. Y.

Works: Newark, N. J.
Established 1857

Testing the Permanence of Colors

One of the simplest methods of testing the permanence of colors and their non-fading qualities is as follows: Take a sheet of unglazed cardboard, give it a coat of shellac to seal it and make it non-absorbent. This sheet should be about 12-in. wide, and as long as necessary, according to the number of colors to be tested. It is then ruled off across the entire width, the spaces being about 4-in. high.

Colors to be tested are then painted across each section, and the name of the color and date of application placed on the reverse side. The sheet is then cut in two vertically and one-half is placed in a drawer or in some place away from the light.

The other half is placed under the exposure desired, and the two are then compared each two weeks until a sufficient period has elapsed to enable one to decide whether to approve the colors or reject them.—C.D.Y.

Since the perfection of mechanical painting and finishing equipment, it has been possible to procure the necessities and refinements of life in the colors one enjoys, and through which one may express his individuality.

Represents Milburn Co., in Middle West

The Alexander Milburn Co. of Baltimore announces an addition to the sales force in the person of Mr. S. W. Perry of Monmouth, Ill. Mr. Perry, formerly with the DeVilbiss Co., has had long experience in the industrial finishing field.

Schaefer Co. Enlarges Plant

The Schaefer Co., Louisville, Ky., is building a modern factory addition which will be of fireproof construction. The new addition will be devoted to the production of lacquers.

Devoted to—
Questions
Answers
Suggestions
Comments and
Discussions on
Specific Problems

Questions and Answers

Information Service

Every issue of *Industrial Finishing* contains a wealth of practical information on various subjects of interest to users of finishes and finishing equipment, but from time to time new problems and questions arise, which demand prompt and authentic information. *Industrial Finishing* is in position to service inquiries, and the editor invites all individuals and concerns in the industry to make known their wants. Every effort will be made to supply the information desired, at no cost to you.

Questions are invited in regard to:

Finishing-room troubles or problems;
Where to obtain certain materials, supplies or equipment;
What methods or materials to use for certain results.

Additional comments or suggestions regarding questions, answers or articles appearing in this section, are invited.

M.&W.Co
1876

LACQUERS ENAMELS

M. & W.
LACQUER ENAMELS

An intimate knowledge of Clear Wood Lacquer requirements, coupled with experience over many years in selection of the Best Covering and Most Permanent Pigments available for lacquers, contribute to the success of M. & W. Lacquer Enamels for all purposes.

Whether for use on Pianos or any grade of Wood or Reed Furniture, M. & W. Enamels can be furnished to meet your requirements.

We invite your correspondence regarding your particular problems.

Maas & Waldstein Co.

Executive Offices and Plant,

438 Riverside Avenue, Newark, N. J.

Chicago Office & Warehouse
1115 W. Washington Blvd.

Los Angeles Office & Warehouse
1212 Venice Blvd.

QUESTIONS AND ANSWERS

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Polishing Brass Corners of Trunks

We manufacture trunks, and would like to find a way in which we can polish brass corners after the trunks are finished. You, no doubt, know that these corners show black spots and that is what we are trying to overcome. In some cases they have rusty spots. Is there any way we can overcome these defects?—I. T. Co.

It would be rather difficult to polish rust spots from brass corners on trunks after the trunks are finished without damaging the finish on the trunk, except by a rather costly and slow hand operation. It would be much better to polish the brass corners on a mechanical buffing wheel before they are installed on the trunks and then apply a coat of clear lacquer or varnish on the freshly-polished brass to prevent it from tarnishing before the corners are installed on the trunks. —L. F. Worlendar.

Stencil Decorating

We manufacture a complete line of juvenile and toy furniture and are very anxious to develop a proper system of applying stencils with a retouching air gun. The writer has noted a good many cases where stencil designs are applied to crib panels and wardrobe drawers and doors in various colors, and we assume that this is done with a series of stencils.—C. K. C & Co.

Stencils can be applied by means of a retouching gun by mounting them on a suitable frame that will permit the stencils to be held closely against the work and thus prevent a "feathery edge" from showing, as would be the case if the stencils were not pressed tightly against the surface at the time of spraying.

Another system of applying stencil decorations is the so-called "silk-screen stencil system of decoration." By this method, several colors can be incorporated in one stencil design with perfect registery of the various parts of the design.—Charles Blanford.

Finishing Soft Metal Tubes

The concern with which I am connected is contemplating putting on the market collapsible tubes similar to tooth paste tubes, etc., but made of pure zinc, copper, aluminum, etc., and I have to finish them, yet I am not acquainted with how this work is done. Can you give me any information in regard to this?—W. S. L.

Collapsible tubes are usually finished with a very flexible oil enamel which is often followed by a coat of clear varnish. Usually the coats are baked at a low temperature, but in some instances they are air dried. In some factories, I believe the metal sheets from which the tubes are made, are coated in flat

sheets by means of special coating machines.

In other factories the tubes are finished after they have been formed, the finishing materials being applied by spraying or by means of special coating machines. Most makers of collapsible tubes have developed special finishing machinery and processes. The finishing materials should be of special design and can be obtained from the larger makers of paints and varnishes who advertise in INDUSTRIAL FINISHING.—W. H. Martindale.

Reclaiming Waste Materials

In an article on reclaiming waste materials (page 25, Oct. issue) I notice Mr. E. F. Werner claims that getting right down to bed rock, he has not had much luck in reclaiming waste material. It has been the practice, at the Ford Motor Co., in Detroit and all its branches throughout the country and abroad, to reclaim waste material such as scrapings from the spray booths.

These scrapings are periodically sent to the Highland Park plant of Ford Motor Co., and reworked into less important lacquers, like those used on chassis and motor. This reclaimed material amounts to hundreds of gallons a month.

While it may not be practical for a small concern to reclaim such from a couple of spray booths in a small shop, the reclaiming of the lacquer from scores and hundreds of spray booths in factories, has been found to be a real paying proposition. Ford Motor Co. has reclaimed lacquers ever since it started using nitrocellulose materials for the finishing of automobiles.

Principally this lacquer has been reclaimed from spray booths by means of a lacquer reclaiming medium, which is a liquid applied to the walls of the spray booth, and it is made such that it is easily mixable with nitrocellulose lacquers, thus giving them hardness and longevity.—K. N. Kathju.

Oil in Cedar Causes Finishing Trouble

We are using incense cedar to manufacture ordinary wood lead pencils. The oil in the cedar interferes with everything we try to paint with. Have tried lacquers and varnishes, but all have the same effect. We are under the impression that the cedar oil is removed before the wood is made into pencils, but do not know how to go about it. Also we understand that eastern concerns have machinery to put on the paint. —J. W. G.

I have no definite information as to the method, if any, used for removing cedar oil from cedar wood before the wood is made into pencils. I do know, however, that cedar oil is injurious to many finishing materials such as varnish and lacquer. The red cedar chest manufacturers have had considerable experience on this subject. Most of them have found that pure white shellac seems to hold back the cedar oil in the wood better than other finishing materials. Recently, however, clear lacquers have been developed which also perform this function. Pencil finishing machinery consists of two types. One is the rubber gasket dipping system which makes use of a rubber gasket mounted on the top of a dip tank, the gasket being provided with a hole slightly smaller than the diameter of the article being coated. The article

More brilliant than Varnish

plus the speed of lacquer

MURPHY Flexible Lacquers, are receiving wide and enthusiastic acclaim among all manufacturers using either lacquer or varnish in their finishing processes.

For it *is* a remarkable thing, to have combined into one product the obvious advantages of the speed of lacquer on the one hand and the obvious advantages of varnish on the other

As you read the characteristics, given below bear in mind your particular work and realize the advantages to you of adapting this material to your own production.

Here are the facts:

1 The basic ingredient of Murphy Flexible Lacquers is not nitrocellulose.

2 They build far better than lacquer.

3 They rub with a pull like varnish, instead of sliding as lacquer does.

4 Polish—we have never seen, even with varnish, a polish of higher brightness. And, unlike lacquer, the finish increases in clarity as it ages, instead of fogging.

5 They toughen with age, instead of chalking and checking.

6 Like varnish, they have a plastic resistance to the expansion and contraction of wood—a notable failure of the rigid finish of nitrocellulose lacquer. They are unaffected by humidity-checking, so much deplored in lacquer.

7 They give the appearance and "feel" of varnish instead of the cold, glass-like surface of lacquer.

8 They are waterproof.

9 They dry as quickly and wear as long as lacquer, but look and act like varnish.

We shall be glad to give you further information or to arrange for a demonstration.

MURPHY VARNISH COMPANY
Newark Chicago
San Francisco Montreal
Essex Varnish Company, Newark
(Associate Company), *Baking Material Specialists*

Murphy *Flexible* Lacquers*

*Murphy Flexible Lacquers include a remarkable new *flat lacquer* which saves half the cost of sanding, compared to ordinary lacquer.

MURPHY FINE FINISHES

Famous for 63 years among architects, master painters and makers of products requiring a fine finish.

Air-drying and Baking Varnishes
Enamels, Lacquers and Stains for Brushing and Spraying and Dipping

Kindly mention INDUSTRIAL FINISHING when writing advertisers

is dipped in the lacquer and pulled through this gasket to remove the excess lacquer and to give a smooth coating. This system is used extensively by manufacturers of broom and brush handles.

Another type of machinery used extensively for coating small articles, such as pencils, wooden handles, etc., is the so-called "slow dipping" machinery by which the articles, mounted on suitable racks, are slowly withdrawn vertically from the lacquer dip tank at a uniform rate of speed approximately equivalent to the "setting up" speed of the lacquer. This deposits a uniform film, free from runs and sags, without any waste from drippings, etc. A A slow motion dipping machine is illustrated on page 59 of Sept. issue.—F. C. Overhauser.

Lacquer Blushing

Under the above title, which heads an article beginning on page 33 of October issue, I believe Mr. Merrifield really did justice to the question that was expounded. It was really a very masterly exposition of the point that he wanted to convey.

However, I still feel that at 95 percent relative humidity, blushing can be effectually eradicated by balancing thinners in such a way as to incorporate "high boilers" right with the thinners, instead of adding them as retarders afterwards. Perfectly balanced thinners will effectually offset blushing almost under any circumstances. I have conducted tests at a couple of automobile plants here in Detroit, and I find that in 99 cases out of 100, on days with almost perfect humidity, blushing was practically done away with.—K. N. Kathju.

Thinner Doesn't Cause Orange Peel

After reading an interesting article (beginning on page 80 Oct. issue) in which Mr. Kam Kathju comments on an article appearing in August issue (page 39), I agree with Mr. Kathju's remarks in every way from a practical standpoint. Of course, it's logical for the salesman to suggest and recommend that his firm's thinner be used with the brand of lacquer he sells. For the past 15 years I've used many different kinds of lacquer of standard make and good reputation, both brushing and spraying, and any of them I have used will take any of the different thinners and cause no orange peel effect.

Orange peel, I think, is caused by not using enough thinner more than anything else. Lacquer applied too thick, under heavy pressure, will cause orange peel. Lacquer applied too thin under high pressure will not cause orange peel. Lacquer can be reduced nearly half under a high pressure and, by applying an extra coat, there will be a job as smooth as a piece of glass.—J. K. Cooper.

Sealer Coat Over Varnish

Referring to the issue of September, on page 81, "Sealer Coat Under Varnish," if John K. Cooper (the author) will secure a can of "Emergency Sealer"* and use it as recommended, I believe he will appreciate the service that this information will have given him.

Also, I am sure that you have many readers who would be interested to know the "brand" of lacquer thinner that when sprayed on old surfaces will "soak" the coating into that inebriated condi-

tion where it may be "blown off." —A. J. Beecher.

*Mfr's name on request.

Filler Dries Slowly

I am particularly interested in articles on the best dryer to use in filler where the room is cold. Filler is supposed to dry overnight. Please advise what quantity to use to each gallon of filler. Would you suggest using litharge?—D. R. F. Corp.

Paste wood filler, when properly made by a reliable manufacturer, does not require the addition of any drier. While it is true that filler, varnish, paint, enamel and similar finishing materials dry more slowly when the temperature is low than when it is above 70-deg. F., it is poor policy to try to remedy the slow drying by adding drier.

It is much better to remove the cause of the slow drying by raising the temperature of the finishing room to at least 70-deg. F. Under no circumstances should dry litharge be added to the filler as a drier. If it is impossible to raise the temperature and it is necessary to add a drier to the filler, a liquid japan drier should be used. Suitable driers for this purpose can be obtained, from the advertisers of finishing materials in this magazine.

There is one point, not mentioned in your letter, which may be partially responsible for your trouble. The naphtha used for reducing the paste wood filler must be free of grease; otherwise the drying of the filler will be greatly retarded. The naphtha can be tested for a grease residue by applying some of it to a piece of white paper and noting whether a greasy residue is left

"Ty-Loid" Striping Lacquers

Are so balanced as to become a part of the Lacquer Enamel Coat.

Solid covering, clean edges, free working, clearness of tone, and fast to light are some of the features embodied in Ty-Loid Striping Lacquers.

Ty-Loid Striping Lacquers are applied the same as old method of striping and will not heel or deteriorate the striping brushes.

In conjunction with Ty-Loid Striping Lacquers, No. 51 Striping Thinner should be used to insure best results.

A trial will convince you of their merits and our prices are right.

Manufactured by

The Western Reserve Varnish Co.

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Price or Quality

A chain is only as strong as its weakest link.

Your reputation, your strongest asset, is only as strong as the materials you employ.

A lasting finish is important. The final appearance of a finished product makes or breaks the whole thing upon which your reputation hinges. It is the final operation, and is seen first.

And since it is equally important for us to see that our materials maintain their standard of quality, we have a point in common.

Your reputation and good will is safe, when you use Stille's Guaranteed Pure Shellac.

Increase your good will; strengthen your chain of satisfied, come again customers; and insure old man turnover, by using Stille Quality.

Samples and prices on request.

E. T. STILLE & CO.

Main Office and Factory
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Southern Office and Factory
High Point, N. C.

after the naphtha has apparently evaporated.—I. F.

Finishing Foundry Patterns

In your issue of September, page 101, "Lacquered Wood Patterns for Foundry Service," Albert Ackerson (the author) probably knows why every foundryman and patternmaker is not coating his patterns with lacquer.

Every claim set forth for lacquer, in this article is approved, but shellac also has some of the virtues for this specific job, which are quite generally known.

"How happy could I be with either,
Were t'other dear charmer away."

It is possible for the user to enjoy the benefits of both lacquer and shellac if he will mix with his shellac, fifty-fifty, a certain brand* of waterproof mixing lacquer.—A. J. Beecher.

*Mfgr's name on request.

More About Orange Peel

I have read with interest the article on orange peel in lacquer finishes by Mr. J. C. Alsee in the August issue (page 39) and the criticism of this article by K. N. Kathju in the October issue (page 60) prompts me to get into this dispute of lacquer characteristics.

From my own experience I have found that the tougher the film and the heavier the application, the more it will orange peel, while on the other hand if the film is brittle and the application thin, it will not orange peel. A wash coat of shellac, for instance, will not orange peel whereas a 4-lb. cut of shellac without reduction will do so badly.

Most sub-shellacs on the market will not orange peel at all because the gum therein is not as tough

as the shellac gum. It can be readily seen that the gum has a lot to do with it.

As far as the thinner used in lacquer reduction is concerned, it really has no bearing on the orange peel, as most of them are universal thinners, but the trouble generally is in the lacquer being tough (which speaks well of the lacquer) or else a too heavy application.

It also is true that some thinners cannot be mixed with certain lacquers because of the reaction to the gum or cotton. This will not cause orange peel but will cause trouble in some other way. I won't discuss this in detail at this time.

Then again there are some thinners that can be safely used to thin oil primers and enamels to speed up drying.

I can take a lacquer that has a tendency to orange peel, spray a surface and make it orange peel badly. Then I can spray another surface with the same lacquer and prevent it from showing any orange peel. On the other hand, a lacquer that ordinarily will not orange peel can be made to do so. A lot depends on viscosity and application.

Most lacquer manufacturers today make their lacquer at spraying viscosity and it would be well for lacquer users to insist on this, as it saves them the time that ordinarily is taken up in reducing the lacquer.

In many cases where a rub job is required, the orange peel is rubbed out completely so after all it does not matter much.

In the case of flat lacquer, the flatter the lacquer the less orange peel you will see, if any at all, but it generally is there just the same, particularly so if applied too heavily.

Eureka Sprayers Excel

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The perfect fan spray gun that spray experts are talking about.

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We will be pleased to discuss your Spraying problems with you and invite you to write us regarding your difficulties.

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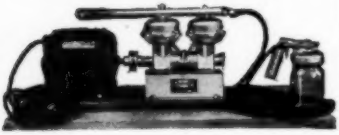

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Here's the low-priced, dependable Spray Unit that is sturdily built for continuous, hard service. Has every necessary feature for successful painting. It is the ONLY low-priced equipment that has an Adjustable Spray Head from fine line to full five-inch, fan-shape flow. Equipped with genuine No. 9 Crown Gun, especially designed for the applying of lacquer, enamel, varnish and paint finishes. No pebbling or pitting - - free from oil and water.

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Los Angeles California

The same applies to pigment lacquers. To prove and illustrate this point, for instance, in rubbing the final coat of lacquer on an automobile, after a minute or so of rubbing take a look at it and you will see orange peel you did not see before and of course, the more it is rubbed the smaller the orange peel becomes; it can be entirely rubbed out if so desired.

Now maybe I am wrong but, as I said in the beginning of this article, this governs my experience.—W. R. Bentin (Finishing Engineer)

Comments on Airplane Finishing

Referring to D. O'Brien's article "Finishing Modern Airplanes in Color," starting on page 27 of October issue, I notice on page 29 under the sub-head "Finishing Metal Parts" this sentence:

"The metal parts of the ship are finished after the same manner of a first-class automobile, except that in no instance is amyl acetate used. The solvents, thinners and pigmented dopes, are all nitrocellulose. This is done so that a nitric acid action on cellulose will exist instead of an acetic acid action on cellulose."

I take exception to the use of amyl acetate in general in first-class automobile finishing. It has not been found necessary to use amyl acetate or its equivalent, pent-acetate, in finishing first-class jobs. In fact, about the only place where amyl acetate has been used very extensively is its use as a retardant to do away with blushing, to a great extent.

It has also been used in some good grades of lacquers, but the common practice seems to be to use ethyl lactate as a retardant, in spite of the fact that it hydrolizes very quickly. Consequently

its use in pigmented lacquers is not very satisfactory, but I doubt if amyl acetate is used very much in the automobile lacquers or thinners any more. Formerly, it was used very extensively.

I would like to find out what the writer of this article in question meant when he talked about the action of nitric acid on cellulose instead of acetic acid on cellulose. Personally, I would not want to fly in an airplane where the residue action of any acid was left on the surface of the plane. The writer (Mr. O'Brien) must have had something very definite in mind when he wrote that, and I plead my ignorance in regard to it. As such, I would like to know precisely what he had in mind when he wrote that sentence.

Again the author of that article has consistently mentioned the use of nitrate thinner with nitrate dopes. He must have had something definite in mind when he talked of nitrate thinners. I would like to know what it was. —K. N. Kathju.

Shellac O. K. For Wood Finishing

In October INDUSTRIAL FINISHING, pages 71 and 72, we find a question asked by W. H. W. in regard to finishing toilet seats. This question is answered by a Mr. C. F. Merrifield, and some of the statements in that answer are so incorrect that we would greatly appreciate it if you would correct them. We have had 79 years experience in manufacturing shellac, and we do not feel inclined to let the statements made by Mr. Merrifield regarding shellac and alcohol go unchallenged.

The question submitted is clearly put and fairly simple, in effect: "Why are oak toilet seats

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rough after dipping in shellac that tests 31 by the hydrometer?"

Mr. Merrifield states it is because "the shellac raises the loose fibers of the wood and stiffens them," and later in the same paragraph says: "All denatured alcohol contains water. . . . It is this water that raises the loose fibers."

As the mis-statements are unintentional we feel sure that Mr. Merrifield will be the first to want to have them corrected.

Again his statement, "The highest proof alcohol contains between five and ten percent water and much commercial alcohol contains as high as 20 to 25 percent of water" is evidently an error. The highest proof (denatured) alcohol is the anhydrous, 200-deg. proof, with no water, which is the best solvent for shellac, though higher in price than the usual 188 to 190-deg. proof. The alcohol generally used is the well-known 180 to 190-deg. proof, containing five percent of water. We have never heard of any alcohol having a lower proof than this being used. Certainly with 20 to 25 percent of water present the alcohol would be totally unfit for cutting or thinning shellac or lacquer.

The last paragraph of Mr. Merrifield's reply, suggesting the use of lacquer or varnish instead of shellac for dipping, reflects unfavorably and unfairly upon shellac. The many millions of gallons of shellac used universally for finishing wood, and at a higher first cost than competing finishes, is sufficient evidence of the more than satisfactory results it gives under modern finishing conditions. The finisher making this particular inquiry is using shellac and has probably used it for many years. He is not asking for a substitute but for information as to how he can overcome a temporary difficulty.

If you will permit us to suggest the remedy for the seats being rough, it is to use a heavier cut of shellac in the dipping tanks. The solution now being used is not sufficiently heavy so there is not enough shellac present to give a smooth coating. This is borne out by the hydrometer test of 31 at room temperature. This corresponds to a 1½-lb. cut which, even with a heavy filler, does not deposit enough shellac on top of the oak to give a continuous surface. When shellac is brushed on, the result is satisfactory because the brushing back and forth deposits enough shellac to form an appreciable film and to give considerable penetration.

The seats may appear to be smooth before dipping, but too thin a coating of shellac or any other finish will magnify the unevenesses of the surface underneath. If a sufficiently heavy coating is applied, the roughness will disappear. Just how heavy the solution of shellac should be depends on conditions, such as the speed of withdrawal, how much gloss is desired, the condition of the surface, etc. But starting with a 4-lb. cut of pure shellac, a few experiments should soon result in a finding of the proper consistency. Somewhere between a 3-lb. and a 4-lb. cut will be about right.

The seats should first be properly sanded and filled, and before dipping they should be free from surface moisture due to humidity. After the proper consistency is found for dipping, this consistency should be maintained. While there are drawbacks in the application of all finishes, we think that shellac will have less than any other for this purpose.—Wm. Zinsser & Co.

Training salesmen to meet the new competition is a real job.

The Blue Knight's Column

I'm very lucky. My best salesmen are the firms with whom I do business.

As a direct result of a recommendation of one of our customers I received this letter from a manufacturer in the Middle West. I'm quoting just one paragraph:

"The writer, with our superintendent and our finishing foreman is leaving here Saturday and will arrive in New York Sunday morning at 9 o'clock. Would it be possible for you to meet us at the Commodore Hotel at about ten-thirty Sunday Morning and discuss the use of lacquer with us? I find that we are at a point where we would like to commence using lacquer immediately. . . particularly lacquer that will give us something in place of what we are now doing in . . . and . . ."

A problem . . . I like problems. They keep my technical department busy and give me an opportunity to do something better than talking price and the other hokum and blarney that raises such commotion five days a week in the ante-rooms of purchasing offices.

If you would like me to pay your factory a visit and investigate your finishing department, address your inquiry to our Sales Department . . . no obligation

The Blue Knight

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There are many more good qualities sealed in the can which space will not permit us to describe.

A communication from you and your request for a sample will convince you of the merits of this product.

Do not fail to send us your finishing problems as our Research Department is at your disposal at all times.

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Finishing Steel Beds in Walnut Brown

We desire advice on methods of finishing bedsteads made of 22-gauge cold-drawn steel tubing. Color walnut brown.

There seems to be some oil or other grease on the tubing. We have experimented with some paint but it comes off easily and does not stick to the metal.

We dip these beds and bake 1½ hours at 160-deg. F. The paint is thinned with gasoline. Process desired should be complete from cleaning metal through baking.—D. B. Co.

Evidently a part of your trouble is due to the presence of oil or grease on the metal before finishing. No finishing material will give satisfactory results over an oily or greasy surface. The first step in obtaining a good finish is to remove this oil or grease.

There are several methods that can be used, depending upon the facilities you have available, the daily production required, etc. The simplest method is to wipe the surfaces with clean cloths which have been saturated with naphtha, lacquer reducer or some similar solvent for grease and oil. In using this method of cleaning, care must be taken to change the wiping cloths for fresh ones frequently; otherwise the cleaning will not be effective. The naphtha or other solvent must also be free of grease and should be discarded as soon as it accumulates any quantity of oil or grease.

Some concerns prefer to dip the articles into a vat of solvent and wipe the surfaces dry with clean cloths as they are removed from the cleaning solution. To eliminate the fire hazard that is always present where large quantities of inflammable liquid, such as naph-

tha, are stored, it is advisable to use a hot chemical solution to remove the oil and grease. There are several well known brands of such chemical cleaners and the makers of these cleaners will be glad to give advice on the construction of cleaning tanks, the strength of solution to use, etc.

A mechanical washing machine can be used to replace the dipping method, if desired. These have the advantage of giving large production with little manual labor. Still a different method that is certain to give good results is to heat the articles to a temperature of 400 to 500-deg. F. for 15 or 30 minutes before applying the finishing materials. This will evaporate the oil and grease.

I assume that the "walnut brown" color referred to means an enamel color approximating that of brown walnut, and that it is not intended to imitate the grained effect of wood. If such is the case a solid-covering brown one-coat enamel can be secured from several of the advertisers in this magazine. If any thinning is done with gasoline you must make sure the gasoline is free from grease. This can be done by pouring a little on white paper and noting whether a greasy spot is left after the gasoline has evaporated. It seems that your baking schedule is rather short for such a low temperature unless the enamel you are using contains little oil.

Over the enamel coat you should apply a coat of gloss varnish, baking it hard and rubbing it flat, or a coat of baking flat varnish in case you wish to eliminate the expense of rubbing the gloss varnish. Of course this varnish coat can be eliminated, but the finish will be much better if it is used.—P. J. Marvington.

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Automobile Refinishing

An automobile painter, who uses lacquer in refinishing automobiles, recently explained in detail the operations necessary in his process. The list of 23 operations follows in sequence:

1—Dismantle car.
2—Remove old finish.
3—Clean metal until chemically clean.
4—Primer coat.
5—Apply putty glaze.
6—Apply "maskote" or taping.
7—Apply first coat surfacer.
8—Apply second coat surfacer.
9—Apply third coat surfacer.
10—Wet Sanding (Wetordry sandpaper and water.)
11—Spot putty.
12—Sand putty spots.
13—First coat of colored lacquer.
14—Second coat of colored lacquer.
15—Third coat of colored lacquer.
16—Fourth coat of colored lacquer.
17—Remove "maskote" or taping.
18—Sand with gasoline (using Wetordry sandpaper.)
19—Spray mist coat of lacquer thinner all over car.
20—Polish; 21—stripe; 22—assemble; 23—polish.

Bulletin Features "BS" Gun

Willard C. Beach Air Brush Co., Harrison, N. J., has just issued for distribution to the industrial trade, a new 4-page bulletin describing and illustrating the new Type BS Featherweight Spray Gun which has "the combination of the patented internal mixture nozzle and air-equalizing chamber features," enabling it to spray any given material at low pressure. This gun is made with a connection for the attachment of a pressure feed cup.

Death Has Called A. Ashmud Kelly

Word received from his son, Arthur P. Kelly, brings news of Mr. A. Ashmud Kelly's death at his home in Malvern, Pa. "He was taken ill on the eighth and left us on the twenty-third" (of October).

Mr. Kelly has long been known as the author of several books on practical painting and finishing, as an editor of a painter's magazine and also a frequent contributor of articles on painting and finishing, these articles having been published in several trade magazines including INDUSTRIAL FINISHING. He was probably close to 80 years of age at the time of his death.

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New Materials and Equipment

Presenting briefly, certain outstanding features of new materials and improved equipment which have been developed for use in modern industrial finishing departments

New Spray Booth; New Ventilating Unit

Paasche Airbrush Co., of Chicago, Ill., has developed a new spray booth made of sectional steel panels, spot welded to angle-iron frames and convertible into larger or smaller sizes by the simple addition of more panels.

According to the company's Bulletin G-28, "the sectional collector baffles pick up all material solids, allowing only the gas to escape through the piping, eliminating combustion and plugging of exhaust piping. They guide the air out and provide free circulation.

"A funnel covers the sprinkler heads for protection against damage and clogging. The vapor-proof reflector is approved by the National Board of Fire Underwriters, and supplies a wide even concentrated light.

"The water and oil separater with electric air-and-material heater provides clean dry air. The air regulator with drop piping furnishes handy control of pressure from a few pounds up to 100-lbs.

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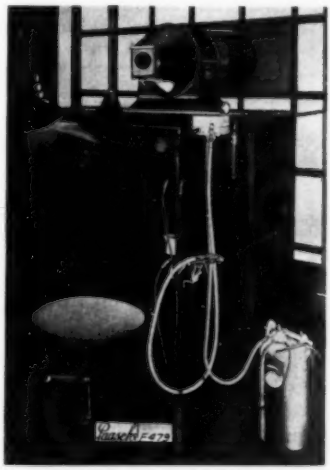

View of new spray booth and ventilating unit.

feed high-speed airpainting unit, all metal turntable, vapor-proof reflector, ready for coupling to air supply."

Foul air is drawn from the booth by what is called an "explosion-proof ventilating unit," consisting of a motor-driven ventilating fan incased in a housing mounted on top of the booth, as shown in the illustration accompanying this article. The fan is made of aluminum and has three blades. "No paint fumes can possibly touch the motor bearings, due to air space between the bearings. Screened air, pulled over the motor, cools it and prevents any possible explosion."

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New Finishing Materials

Mayer & Loewenstein of 4343 Vernon Blvd., Long Island City, N. Y., announces two new finishing materials called respectively "Fillcote" and "Speedicote Rubbing." According to Harry Antle, Finishing Engineer, "Fillcote is a varnish first coater which can be coated in four hours and used in place of shellac or shellac substitute under varnish. It does not raise the grain of the wood, and it dries to a smooth and full-bodied film."

The material can be put on heavily if so desired—by dipping, tumbling or spraying—and it does not blush or bloom under any conditions of humidity. It can be reduced with a turpentine substitute like "Varnolene" or V. M. & P. naphtha.

"Speedicote Rubbing" is a varnish which can be put on and rubbed the next morning. It is tough and durable, and when used over "Fillcote," it gives a fine finish and permits real speed in production. The two products knit together to produce an effective finish.

New Spray-Painting Outfit

The DeVilbiss Co. of Toledo, Ohio, announces the new Type TZ spray-painting outfit to meet the demand for a low-priced spray-painting equipment that will include dependable efficiency and assure satisfactory results in the hands of an untrained user. The outfit successfully sprays all the modern lacquers, as well as paints, varnishes, enamels, stains, shellacs, and bronzes, and it enables anyone to take full advantage of the almost limitless opportunity afforded today for decoration, preservation and renewal of

all household, store, office and factory equipment and products.

The combination hand-pump and air reservoir operates easily with one hand, storing up air pressure in the reservoir and providing a

Air pressure is pumped by hand

steady, uniform flow of air through the gun. The glass container for material is easily attached and detached. The gun is under perfect control at all times and, being simple and durable in construction, it is quickly and easily cleaned.

For convenience, various kinds and colors of materials may be kept in extra glass containers, with covers, ready for instant use. The DeVilbiss gun is so designed

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For the user of industrial spray equipment this new *Economy DeLuxe Sprayer* gives better application of any paint, varnish or lacquer. Combines high efficiency, simple operation and puts new life in the paint shop. Light in weight, does not clog, easily cleaned. There are many good reasons for the present popularity of Economy Spray Products PRICED: *DeLuxe Spray Gun—with material tube, cover, container, 25 feet air hose and connections and agitator . . . $32.00. Above without agitator . . . $30.00. DeLuxe Gun without any of above accessories . . . $22.00. 25 feet air hose with connections . . $4.50. 1 quart metal container without cover . . . $2.50.*

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that ordinary pint fruit jars with screw tops may be used for this purpose.

Portable Spray Outfit

The Kellogg Mfg. Co., Rochester, N. Y., has brought out a complete new spray painting outfit that includes a compressor, pressure regulating valve, fan type gun, suction feed paint cup and air hose—all mounted on a low flat truck bed as shown in the accompanying illustration. It is designed to meet the requirements of the individual or concern

that needs spray-painting equipment for refinishing, maintenance painting or occasional production work.

The compressor is the Kellogg two-cylinder Model 52, 2¼ bore by 2-in. stroke, rated at 4-cu. ft. per minute, mounted on wheels and driven by a ¾-h.p. motor. An extension cord is furnished. All that is necessary is to plug into the nearest lamp socket, fill the paint cup, and the outfit is ready for work.

The spray gun is the Kellogg "Type B" standard, which can be used with lacquers or oil paints.

Know your costs—know whether you are making or losing money every day.

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We answer: They are uniform in color, drum after drum. They don't vary in shade with each new batch. This means your product exactly matches in color and finish day after day.

They produce a beautiful smooth lustrous finish, durable and resistent to wear.

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Choice of 64 standard colors — brilliant shades, those popular today — or your special color made to order.

These features of Hilo Baking Enamels impress the man who wants the best possible finish.

Because Hilo Colored Baking Enamels have proved their quality, hundreds of products today are Hilo finished.

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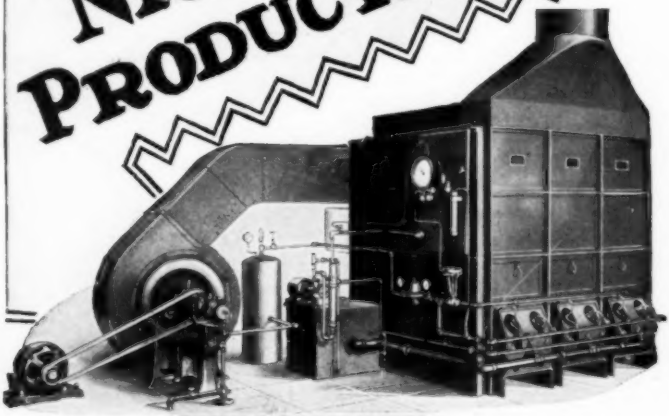

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These heaters are frequently installed to good advantage with existing oven equipment. In many instances however, large savings can be effected by installing modern continuous or progressive equipment.

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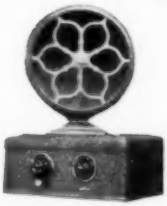


Superintendent of finishing in large radio factory calls attention to characteristics of new wrinkle finish being used on metal cases and explains in detail the operations included in a typical finishing job

By Joseph F. Schmoegner

FORMERLY the word "finish" usually implied a highly polished or glossy surface. Some years ago, however, a number of rough-texture finishes were introduced. In these, mechanical means were applied to stipple the surface, but recently certain self-wrinkling varnishes have attracted considerable attention. One of these new wrinkle finishes, I will endeavor to discuss in this article, as I have had some experience in using it. I have found it attractive and economical to produce—when it is properly employed.

Naturally, the very nature of this finish—presenting as it does a rough, irregularly-figured surface—is such that it will effectively hide numerous slight surface defects in the metal, and will produce a satisfactory finish in one coat. A finish of practically any desired color, tint or shade can be easily produced with two coats. If sprayed in pastel shades, it will give the finished articles an appearance of singular beauty that closely resembles damask silk fabrics.

This new finish is being used on a variety of products including radio sets, loud speakers, electrical appliances, toys and decorative novelties. It has been adopted by a number of manufacturers to replace ordinary baking japan.

In order to give specific information in regard to the use of this material, I will explain the operations on a definite article to be finished, starting with the cleaning process and continuing through to the application of the final coat. The article to be finished is a pressed-steel radio cabinet.

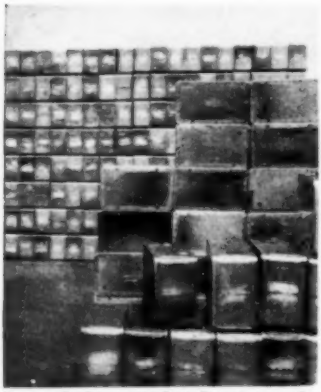
A Typical Cabinet Job

This particular cabinet that I am about to send through the finishing room has been assembled from three pieces—front, and back panels and bottom. The front and back panels join in the center at the ends of the cabinet. These joints should be gas welded and ground to a level surface, which will give us a one-piece cabinet.

However, if cost should not permit gas welding of the seams, we will probably have to be satisfied with a less reliable method of filling in the seams. To solder the seams after they are electrically spot welded would be almost as costly as gas welding, and it would be less satisfactory. The

next best method would be to use an elastic filler that would stand baking temperature without shrinking.

From the standpoint of economy we may adopt the last-named method. This seaming compound is fairly hard in its original state and, in order to fill up seams, we must use heating elements similar to the "burning-in" method used to repair scars on finished furniture. This method of filling



Some of the pressed-steel cases; notice seam at center of each end.

will work satisfactorily on articles that are properly spot welded, provided their abuse from handling is cut down to a minimum.

Cleaning the Surface

This sealing compound we apply directly to the steel surface which, of course, should be clean of any trace of oil, grease or stamping compound. In cleaning these surfaces, care should be taken that every trace of grease and stamping compound is removed. An industrial alkali will serve well for this process, provided, we do not depend entirely on the immersion method of washing, but carefully scrub each article clean with a scrubbing brush.

In order to reduce rejects to a minimum we should, from the beginning, take every precaution to have the articles clean, and it would be well to clean every cabinet again as soon as it leaves the seaming department. In this

A few loudspeaker cases.

case we cannot use the alkali process, on account of the hot water, which would penetrate below the seam and cause the filling compound to drop out. Wiping with a minimum amount of naphtha should remove all finger and sweat marks that are left from the filling process.

Applying Wrinkle Coat

Our cabinet, in its present state, is ready for the wrinkle coat. Due to the fact that wrinkle finishes are what might be termed "freak" finishes, we should take due precaution to have the material uniform in consistency. Hydrometer and viscosity readings should be taken at those times when the material gives the least amount of trouble—in other words, when it is at its best—and these readings may then be used as reliable standards. By following this practice the finisher will escape a lot of trouble.

The spray operator will soon

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These facts are contained in an Independent Engineering Survey. You are welcome to a copy, without cost, if you request one on your business letterhead.

To clean RIGHT see JOHN PIRIGHT

INTERNATIONAL CHEMICAL CO.

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View across top of some of the modern cleaning equipment.

learn what is the correct amount of material to spray. An even, full coat is necessary, but care must be exercised to avoid runs and sags. If the spray operator notices pin-holes on a wet coat, this should be sufficient warning that the surface is greasy. A greasy surface will cause a decidedly different type of wrinkle —usually one that is more or less "flat," or sometimes of a sandy appearance.

Properly applied, a wrinkle finish should reveal a variety of wrinkles, somewhat resembling a forest of pine trees as viewed in the distance. There are materials on the market that will unfailingly give the above results on a large production basis—if they are properly applied and if reasonable precautions are observed throughout the finishing process.

Speed; Temperature

To obtain uniform wrinkling, the finish should be oven-dried. I prefer gas-heated ovens with conveyors to carry the articles through. The temperature should be thermostatically controlled, and there should be hourly chart readings, so as to eliminate any guesswork in regard to temperature which, of course, is of vital importance if we expect uniform wrinkling and a uniform degree of hardness.

A means of speed control and a speedometer should be available, in case it becomes necessary or desirable to change the speed of the conveyor in the oven. One must exercise care and good judgment in connection with making any changes in the speed of oven baking. If the rate of conveyor travel is speeded up, a higher temperature will be required in the oven to produce, in less time, the same results as were obtained at slower travel with lower heat.

The correct temperature for the "wrinkling chamber" generally depends upon the particular make of wrinkling varnish used. The same thing applies to the baking temperature. The entire process should require between one and two hours, depending upon temperature and speed control.

Other Important Factors

One other vital factor should be taken into consideration: It is

A battery of spray booths along wall at left.

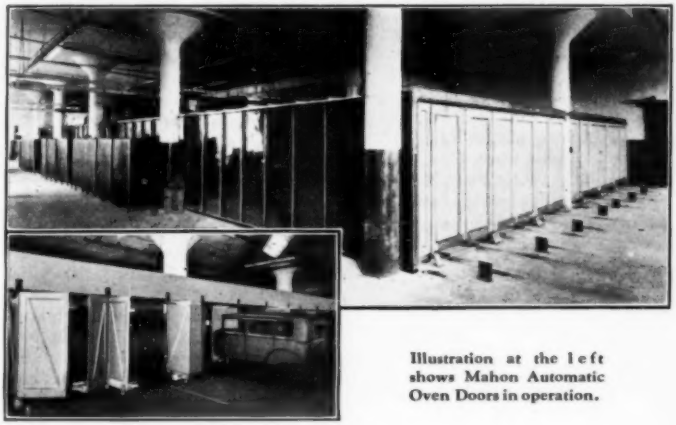

Illustration at the left shows Mahon Automatic Oven Doors in operation.

Mammoth Ovens for Modern Production

In solving the oven problem for America's leading auto body manufacturers, Mahon engineers have developed an oven built from standard insulated sections completely covered with metal. This development has resulted in the economical production of several types of ovens for various uses in the automotive field. Fitted with automatic doors, Mahon Tunnel Type Ovens adapted to conveyor production lines have proved a great factor in speeding up painting operations. Write for our latest folder on Mahon Industrial Drying Ovens.

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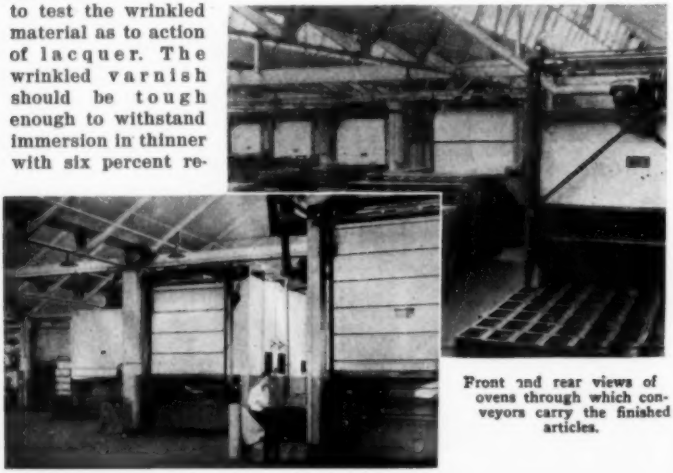
the amount of pigments the wrinkling varnish contains. A transparent or merely stained varnish is considerably safer to use than a pigmented varnish, providing we "second-coat" with lacquer. A transparent varnish will give a tougher surface while a pigmented varnish will be more or less porous, and is more likely to break down eventually under the action of our pyroxylin lacquer coating.

An efficient spray operator should produce a finish with a negligible amount of rejects. However, in heavy production, it is almost impossible to get 100 percent efficiency; we must expect a small percentage of rejects. It is difficult to correct the effect of a spray coat that is too light, unless it is so light that it can be second-coated. A spray coat that is too heavy, may often be saved by the use of an erasing knife, using it in a manner similar to the draftsman who uses it to erase marks on drawing paper.

After the baking process, we should make it a rule to test the wrinkled material as to action of lacquer. The wrinkled varnish should be tough enough to withstand immersion in thinner with six percent retarder after the thinner has evaporated. It should have a slight "tackiness" but should not yield under the pressure of a finger nail. This tackiness should disappear in about 15 to 20 minutes after complete evaporation takes place. This is the most important point of baking, as it permits the formation of a proper bond between the wrinkle and lacquer coats.

Painting to increase light reflection is a well-established reason, especially in industrial plants where sufficient daylight not only decreases costs for electric light, but decreases accidents to machine operators and actually increases production by making workers more effective and more content.

In today's battle for supremacy, which is merely another way of pointing to the strong competition that has developed between industries and not among those engaged in any one industry, each is making a trong bid for public favor.



Front and rear views of ovens through which conveyors carry the finished articles.

Finishing Enameled Ware

Describing the cleaning of metal surfaces and the various operations included in the vitreous enameling process which finishes what we ordinarily call "enamel ware" or "porcelain enameled goods"

By Robert L. Kent

THE same care necessary in the finishing of a fine cabinet is essential in the finishing of enamel ware. First, of course, there is the preparation of the enamel—a process requiring an exact knowledge that is not exceeded in any other phase of finishing.

The chemicals, or ingredients—borax, nitrates, saltpetre, cobalt, kryolith, tin, flourspar, clay, soda and feldspar—when mixed in the definite proportions required, are put into a furnace at a temperature of about 2500-deg. F., where the mass remains until it has completely fused, requiring between three or four hours. When the fusing has been accomplished the molten mass is drawn off into a vat of cold water, this action having the effect of breaking up the material into slivers, known as "frit." The frit is allowed to dry and then it is placed in a large mill together with predetermined quantities of coloring materials and clay.

The function of the mill is to grind the mixed frit, coloring and clay into a fairly fine powder. The mill itself is lined with porcelain blocks and is filled about three-fourths full of flint pebbles, the hardness of flint making these pebbles ideal for the work they are expected to do. Water is added to the mixture, the cover of the mill is clamped down tightly and the mill is started revolving. The motion of the pebbles grinds the enamel, the mixture in the form of an emulsion finally being drawn off into small vats, ready for use.

Application of Enamel

The enamel is applied to the utensils either by hand dipping or by spraying, the former probably being the most satsifactory in a good many instances. Proper consistency of the enamel at the time of application is of the utmost importance and this must be watched constantly if the finish of the various "batches" is to be uniform. When ready for the actual application to the product, the enamel is put in large bowls and tempered to the consistency of thick cream.

In one of the largest plants in the country devoted to the manufacture of cooking utensils, the various articles are dipped into this enamel emulsion and then shaken by hand in order to get uniform distribution and correct thickness of the enamel over the entire utensil. Following the dipping and shaking, each article is placed on a drying rack and allowed to dry thoroughly, after which it is inspected. If the article has been coated satisfac-

torily it is fired in a furnace at a temperature of 1800-deg. F.

In one plant where the better grades of enamel ware are produced, each item is given three coats of enamel. The first coat, which is in the nature of a binder or priming coat and really prepares the utensil for the two final finish coats, is a dark blue-black.

After this coat has been fired, the first of the two coats of white enamel is applied. This is allowed to dry and then before the firing process is repeated, the blue bead enamel is put on the rim and handle. The second coat of white enamel and the final finish is then applied and allowed to dry, after which the article goes through the firing process for the third time.

One of the greatest difficulties in finishing utensils that go through the firing process and one which is very often encountered in the finishing of other products, is to prevent marring the appearance of the article by "burning marks," which may be formed where the object is supported in the furnace.

Cleaning Metal Surfaces

Cleaning is an important element of the work of producing perfectly finished enameled ware. A manufacturer of enameled gas ranges receives the ingot iron sheets (used for making the panels) dry and somewhat over-annealed to increase the size of the grains in the metal. This is a very desirable condition because, after the pickling operation, the metal has a surface that holds the enamel extremely well. These sheets first must be drawn, and for this a compound containing oakite is used.

In view of the fact that the success of the enameling process depends to a large extent on the condition of the metal surface to which the enamel is applied, great care is exercised in cleaning the surface. In the interest of economy, the entire process has been so systematized in this plant that maximum results are obtained with the least loss of time.

There is a continuous production flow. The panels are hung on monel metal hooks attached to conveyors and first enter a cleaning tank. A cleaning material of exceptionally long life is used and 6,000 pieces a day are routed through one tank. Following the cleaning the pieces go through a boiling rinse; next an acid pickle followed by a cold spray. A green-colored film forms on the metal during this process and this must be removed; otherwise rust forms.

Operations in Process

The last dip, before proceeding with the enameling process, is in a solution of borax; particles of the borax are retained by the metal and act as a flux in the later operations.

Following this operation the pieces are ready for the enameling. Right here it may not be amiss to point out that because of the multiplicity of operations, efficiency in routing and handling are essential; otherwise the cost of production is raised to a point where it becomes impossible to compete in price with concerns who have scheduled their work so that all lost motions and waste are eliminated.

The importance of the factor of cost cannot be emphasized too strongly, because upon it hinges the success of the business. Too many manufacturers are sacrificing profits these days in order to beat out competitors, apparently disregarding entirely the need for profitable business development.

Use Conveyor Equipment

Wherever possible, the use of the most modern conveyor equipment will prove to be a sound investment. This is not an ad for the manufacturers of this equipment; the statement is based on knowledge of modern manufacturing requirements in this and other industries. When one man can do the work formerly done by four, the economy is obvious.

Operations in Process

But to get back to the enameling: The first operation consists of brushing on a ground coat after which the pieces are placed in ovens for drying. From the ovens the articles are transported to a rotary electric furnace, with variable-speed motors which are synchronized to the rest of the system. When they are removed from the furnace they are straightened. Application of two more coats of enamel, a baking and straightening operation after each coat—these operations complete the process and the pieces are ready to go to the assembly room.

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EDITORIAL

Business Reports

Brief high lights in the November issue *Commerce Monthly*, published by the National Bank of Commerce in New York, reveal that:

1—One of the most active seasons of fall and winter business that the country has ever known is now under way. Exceptionally high rates of production in numerous lines of industry, better employment, and abundant crop outturn, the rising volume of railroad traffic which is at last outtopping the high figures of two years ago, the quickening of retail trade—these form the background of the reasonably high level of current prosperity.

2—Apparently an improvement in major textile industries.

3—Industries centering about steel are particularly prosperous—automobiles, farm implements, machine tools, structural steel and railroad equipment.

4—It is highly probable that the value of construction undertaken in 1928 will again surpass that of any previous year, but the outlook of the next few months seems to be a somewhat larger decline than the usual seasonal letdown. The retarding influences include current higher interest rates, increased costs of construction and a gradual decline in rents.

5—For farmers, live stock is in demand and bringing good prices, but many of the larger crops of grain and fruit are too abundant to bring altogether satisfactory prices at this time.

6—Money rates continue firm. The increase in the commercial demand for credit incident to fall business, during September and October, was somewhat less than usual, and it now appears that we shall pass through the balance of the fall period without a heavy strain upon bank resources to meet commercial requirements. The remarkable demand for money for the security markets continues.

Important Conventions Held

During the week of October 15 to 19 three important organizations in the paint and varnish industry held their conventions in Detroit at the Book Cadillac Hotel. They were The National Federation of Production Clubs, American Paint & Varnish Manufacturers' Association, Inc., and the National Paint, Oil & Varnish Association.

Much of interest and value was brought forth in the course of the various business meetings, while numerous entertainment features provided plenty of opportunities for recreation, refreshment and relaxation.

In the closing session of the National Paint, Oil & Varnish Association, Charles J. Casper of Pittsburgh was elected president for the ensuing year. Mr. Casper is central district manager for the Pittsburgh Plate Glass Co. Charles J. Roh, Newark, N. J., was elected treasurer and George V. Horgan was reappointed as General Manager at the directors' meeting following the election. Five regional vice presidents were elected for the respective zones as follows:

Canadian.....A. W. Poole, Toronto.
Central..G. M. Breinig, Kansas. City.
Eastern....E. P. Lynch, Providence.
Southern.....F. J. Cooledge, Atlanta.
Western .....
.....W. F. Bennett, Salt Lake City

Elliott Schuyler Phillips, a young man of 35 years of age and head of Devoe & Reynolds Co., Inc., was elected president of the American Paint & Varnish Manufacturers Association.

Paul D. Buckminster of the Martin Varnish Co., Chicago, was elected president of the Federation of Production Men's Clubs. Other officials elected included vice-president, E. J. Probeck of Jones-Dabney Co., Louisville; treasurer, Ralph Everett, Keystone Varnish Co., Brooklyn; secretary, George Heckel, Philadelphia.

Finishes at Chicago Radio Show

At Chicago's Seventh Annual Radio Show, held in the Coliseum during the second week of October, there was exhibited more than $1,000,000 worth of the choice handicraft of 300 manufacturers of radios.

Cabinets range from a variety that are designed to harmonize with furniture now in the home, to the more artistic styles ranging from ancient period replicas to modernistic designs. Color is found as never before, the most brilliant and daring shades standing forth and commanding attention on all sides. There is an absence of "freak" and novelty numbers, indicating evidently that the industry regards itself in a more conservative light and that the radio is becoming an appreciated article of interest and value for the home. The same set may be presented in a dozen different styles and finishes and each one will have its group of admirers.

Noted at random in the Coliseum, were creations of Italian renaisance, early English, high-boy and low-boy consoles, exquisite art furniture designs to match with the best of modern or period furniture, Tudor designs in rare woods, metal finished cabinets with either cabinet or stand type of support—all in a variety of finishes, colors and treatments.

A table cabinet in four color combinations was particularly attractive. The same exhibit included the console and high-boy in the same variety of colors. Another finish that ranked among the first in attention received, was a model inclosed in an antique maple or early American or Colonial pattern that would harmonize with the most costly of furniture. A receiving set of die-cast aluminum, lacquered in dark green with silver striping was much admired.

Amplifiers or speakers come in for their share of finish development. They range from the table outfits to units that have their own cabinets. Speakers today either match the set in color and finish or gain favor by suitable contrast. An improvement that adds to the appearance of the speaker is the colored tapestry screen. These screens of great beauty in themselves, harmonize with either the speaker or the set or even the

room decoration, and give a beautiful decorative value to what was formerly covered with a grating or woven metal guard.

The artist at last has been consulted in the matter of cabinets and consoles in period styles, for the modernist ventures have become the unusual. Once more has triumphed the feminine demand for a better appearing article of furniture.

Competition in this industry has played its part in causing the radio industry to utilize the best and latest developments of all finishing products, ideas and methods, for upon the artist and the master finisher in this industry depends, to a great extent, each firm's share of next year's business.

Radio Show Finishes

A visit to the recent radio show sponsored by the Rochester Radio Trades, Inc., (Rochester, N. Y.) held in Convention Hall, should have convinced the most skeptical that bright colors and vivid hues are popular in the radio field. For this big convention, master decorators had transformed this huge hall into a thing of beauty by the use of gayly decorated buntings and festoons of electric lights, all of which added to the beauty of the $500,000 worth of radios, many of which seemed to vie with the gay decorations in the matter of color.

Here for the first time, we saw radio sets in colors—bright vivid colors made to harmonize with the furnishings of the finest homes. One company offered its sets in a choice of five colors. Then there was exhibited a handsome set housed in a striking-high-lighted, gold ripple finish. An attractive bench finished to match the radio, in a delightful antique finish, was in a unique Spanish design and advertised as "the modern radio for modern needs."

Despite the trend to colors by some makers of radio sets, the show included splendid examples of the popular wood finishes, both in walnut and mahogany. Some of these were moderately plain, while others were enhanced by graceful wood carvings, finished with a degree of the master workman's art—making for the radio a place in the best rooms of the finest homes. Many of the cabinets showed a hand-rubbed finish.

While the number of metal cabinets at the Rochester show was greater than ever before, the wooden radio cabinet, because of its greater appropriateness as furniture, has lost none of its popularity. Walnut veneers, cut to show the beautiful grain of the wood and enhanced by the finishers art, left nothing to be desired in the way of decorative effects.

The present day trend toward the Art Moderne, as applied to interior decoration, will undoubtedly make the radio in colors very popular with those who give close attention to harmony of colors in home furnishing today.—Arthur J. Owen.

No profit is made until merchandise is sold. No sale is satisfactorily made until the customer is satisfied.

Here's an interesting truth: People do not see what they are looking at. They see only that which is pointed out to them.

The American public will always pay for what it wants and the very first principle in merchandising is to discover something that the crowd wants and will pay for.